ConnectX®-3 Ethernet Single and Dual SFP+ Port Mezzanine Card User Manual for Open Compute Project

P/N:

MCX341A-XCCN, MC342A-XCCN, MCX341A-XCDN, MCX342A-XCDN, MCX341A-XCEN, MCX342A-XCEN

Rev 1.8

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Revision History

This document was printed on July 3, 2014.

Table 1 - Revision History Table

Date	Rev	Comments/Changes
July 03, 2014	1.8	• Updated Air Flow. See Table 8, “MCX341A Specifications Table,” on page 43 and Table 9, “MCX342A Specifications Table,” on page 44. • Added NC-SI pinout. See Appendix D.4, “NC-SI Interface Pinout,” on page 59.
May 15, 2014	1.7	• Added Section 3.4, “Card Installation Instructions,” on page 16 • Removed changes MCX341A-XCEN Rev A3 to Rev A6 from Appendix B, “Card Change History,” on page 51 • Added ***Note*** on labels • Added Section 7.3.1, “Mylar Mechanical Drawing and Dimensions,” on page 47 • Added Appendix A, “Bezel Assembly (Optional),” on page 49
March 28, 2014	1.6	• Added Section A.5 on page 46 describing Mylar addition to cards • Updated MX341A-XCEN label in Appendix B on page 49 to show Rev A6
November 05, 2013	1.5	• Updated structure of the User Manual • Added Section 7.2, “MCX342A Specifications,” on page 44 • Added Figure 8, “Mechanical Drawing of the Dual-port MCX342A Mezzanine Card,” on page 46 • Added Appendix B.4, “Changes in MCX341A-XCEN from MCX341A-XCDN,” on page 51 • Added the following note to Chapter 5,“Updating Adapter Card Firmware” on page 38: Note: The shown versions and/or parameter values in the example below may not reflect the latest or actual values for this product, and are included here for illustration purposes only. • Added Chapter 6,“Troubleshooting” on page 40 • Added Appendix C.1, “Retrieving Adapter Card GUID,” on page 55
October 16, 2013	1.4	• Added MCX342A-XCCN, MCX342A-XCDN, MCX341A-XCEN and MCX342A-XCEN
April 17, 2013	1.3	Added MCX341A-XCDN to the document Added Appendix B.3, “Changes in MCX341A-XCDN from MCX341A-XCCN,” on page 51
December 11, 2012	1.2	Updated Figure 7, “Mechanical Drawing of the Single-port MCX341A Mezzanine Card,” on page 45

Date	Rev	Comments/Changes
December 6, 2012	1.1	Updated label in Figure 13, “MCX341A-XCCN Board Label (Example only - see Note),” on page 52 Added note to Section 3.4, “Card Installation Instructions,” on page 16 Added Appendix A, “Bezel Assembly (Optional),” on page 49 Added “Cable Support” to Table 8, “MCX341A Specifications Table,” on page 43
September 2012	1.0	First Release

About this Manual

This *User Manual* describes Mellanox Technologies ConnectX®-3 10 Gigabit Ethernet Single and Dual SFP+ Port PCI Express x8 Mezzanine cards. It provides details as to the interfaces of the board, specifications, required software and firmware for operating the board, and relevant documentation.

Intended Audience

This manual is intended for the installer and user of these cards.

The manual assumes basic familiarity with Ethernet networks and architecture specifications.

Related Documentation

Table 2 - Documents List

Mellanox Firmware Tools (MFT) User Manual Document no. 2204UG	User Manual describing the set of MFT firmware management tools for a single node. See http://www.mellanox.com => Products => Software => Firmware Tools
MLNX_EN for Linux README Driver Kit for Mellanox Adapter Cards with 10GigE Support Document no. 2950	This document provides information on the MLNX_EN Linux driver and instructions for installing the driver on Mellanox ConnectX adapter cards supporting 10Gb/s Ethernet.
Mellanox OFED for Linux User Manual Document no. 2877	User Manual describing OFED features, performance, InfiniBand diagnostic, tools content and configuration.See http://www.mellanox.com => Products => Software => Linux SW/Drivers => Mellanox OpenFabrics Enterprise Distribution for Linux (MLNX_OFED)
WinOF VPI for Windows User Manual Document no. 3280	User Manual describing WinOF features, performance, InfiniBand diagnostic, tools content and configuration. See http://www.mellanox.com => Products => Software => Windows SW/Drivers => Mellanox OFED for Windows (WinOF)
Mellanox MLX4_EN Driver for VMware README Document no. 3527	User Manual describing MLX4_EN driver for VMware features, performance, diagnostic, tools content and configuration. See http://www.mellanox.com => Products => Software => Ethernet Drivers => VMware Drivers
INF-8074i Specification for SFP (Small Formfactor Pluggable) Transceiver Rev 1.0 May 12, 2001	This specification describes the SFP (Small Formfactor Pluggable) Transceivers developed by the MSA (Multiple Source Agreement) group.
IEEE Std 802.3 Specification	This is the IEEE Ethernet specification http://standards.ieee.org/getieee802

PCI Express 3.0 Specifications	Industry Standard PCI Express 3.0 Base and Card Electromechanical Specifications

Online Resources

- Mellanox Technologies web pages: http://www.mellanox.com
- Mellanox Technologies Firmware download web page: http://www.mellanox.com => Support => Download Center

Document Conventions

When discussing memory sizes, MB and MBytes are used in this document to mean size in mega bytes. The use of Mb or Mbits (small b) indicates size in mega bits.

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1 Introduction

This is the User Guide for Mellanox Technologies Ethernet adapter cards based on the ConnectX®-3 EN integrated circuit device. These adapters connectivity provide the highest performing and most flexible interconnect solution for PCI Express Gen3 servers used in Enterprise Data Centers, High-Performance Computing, and Embedded environments

This chapter covers the following topics:

- Section 1.1, “Product Overview,” on page 11
- Section 1.2, “Features and Benefits,” on page 13
- Section 1.3, “Operating Systems/Distributions,” on page 14
- Section 1.4, “Connectivity,” on page 14

1.1 Product Overview

The following tables provide the ordering part number, port speed, number of ports, and PCI Express speed.

Table 3 - Single-port 10 Gigabit Ethernet Adapter Cards

Ordering Part Number (OPN)	MCX341A-XC[C/D/E]N
Data Transmission Rate	10GigE
Number of ports	MCX341A-XCCN: single-port SFP+ IPMI disabled MCX341A-XCDN: single-port SFP+ IPMI enabled MCX341A-XCEN: single-port SFP+ with IPMI and UEFI IPv6 support
PCI Express SERDES Speed	PCIe 3.0 x8 8GT/s
RoHS	R6
Adapter IC Part Number	MT27518A1-FCCR-XE
Device ID (decimal)	4099 for Physical Function 4100 for Virtual Function

Table 4 - Dual-port 10 Gigabit Ethernet Adapter Cards

Ordering Part Number (OPN)	MCX342A-XC[C/D/E]N
Data Transmission Rate	10GigE
Number of ports	MCX342A-XCCN: dual-port SFP+ IPMI disabled MCX342A-XCDN: dual-port SFP+ IPMI enabled MCX342A-XCEN: dual-port SFP+ with IPMI and UEFI IPv6 support
PCI Express SERDES Speed	PCIe 3.0 x8 8GT/s
RoHS	R6
Adapter IC Part Number	MT27518A1-FCCR-XE
Device ID (decimal)	4099 for Physical Function 4100 for Virtual Function

1.2 Features and Benefits

Table 5 - Features

PCI Express (PCIe)	Uses PCIe Gen 3.0 (1.1 and 2.0 compatible) through an x8 edge connector up to 8GT/s
10 Gigabit Ethernet	Mellanox adapters comply with the following IEEE 802.3* standards: IEEE Std 802.3-2008 Ethernet IEEE Std 802.3ae 10 Gigabit Ethernet IEEE Std 802.3ad Link Aggregation and Failover
Memory	PCI Express - stores and accesses InfiniBand and/or Ethernet fabric connection information and packet data SPI - includes one 16Mb SPI Flash device (M25PX16-VMN6P device by ST Microelectronics) EEPROM - accessible through the I^2C-compatible interface. The EEPROM capacity is 4Kb.
RDMA over Ethernet (RoE)	Leveraging Data Center Bridging capabilities, RoE provides efficient low latency RDMA services over Layer 2 Ethernet.
CPU offload	Adapter functionality enabling reduced CPU overhead allowing more available CPU
Sockets Acceleration	Applications utilizing TCP/UDP/IP transport can achieve industry leading throughput over InfiniBand or 10GbE. The hardware-based stateless offload engines in ConnectX-3 reduce the CPU overhead of IP packet transport. Sockets acceleration software further increases performance for latency sensitive applications.
Quality of Service (QoS)	Support for port-based Quality of Service enabling various application requirements for latency and SLA
Hardware-based I/O virtualization	ConnectX-3 provides dedicated adapter resources and guaranteed isolation and protection for virtual machines within the server.
SR-IOV	ConnectX-3 SR-IOV technology provides dedicated adapter resources and guaranteed isolation and protection for virtual machines (VM) within the server. I/O virtualization with ConnectX-3 gives data center managers better server utilization while reducing cost, power, and cable complexity.
IPMI support	Enabled for the following: MCX341A-XCDN, MCX342A-XCDN MCX341A-XCEN, MCX342A-XCEN
Wake-on-LAN (WoL)	To be updated in future release.
Reset-on-LAN (RoL)	To be updated in future release.
NC-SI	The adapter supports a slave Network Controller Sideband Interface (NC-SI) that can be connected to a BMC. Enabled for MCX341A-XCGN and MCX342A-XCGN.

Table 5 - Features

Unified Extensible Firmware Interface (UEFI)	See Section 2.5, “Unified Extensible Firmware Interface (UEFI),” on page 15.

1.3 Operating Systems/Distributions

- Novell SLES, Red Hat Enterprise Linux (RHEL), Fedora, CentOS and other Linux distributions.
- Microsoft Windows Server 2008/CCS 2003, HPC Server 2008
- OpenFabrics Enterprise Distribution (OFED)
- OpenFabrics Windows Distribution (WinOF)
- VMware ESX Server 3.5, vSphere 4.0/4.1

1.4 Connectivity

- Interoperable with 10GigE switches
- SFP+ connectors
- Passive copper cable and Optical Modules support
- Powered connectors for optical and active cable support

2 Interfaces

Each adapter card includes the following interfaces:

- "Ethernet SFP+ Interface"
- "PCI Express Interface"
- "I2C-compatible Interface"
- "LED Interface"
- "Unified Extensible Firmware Interface (UEFI)"
- "Hardware Installation"

2.1 Ethernet SFP+ Interface

The network ports of the ConnectX®-3 adapter cards are compliant with the IEEE 802.3 Ethernet standards listed in Table 5, "Features," on page 13. The SFP+ port has one Tx/Rx pair of SerDes. Ethernet traffic is transmitted through the cards' SFP+ connectors.

2.2 PCI Express Interface

The ConnectX®-3 adapter cards support PCI Express 3.0 (1.1 and 2.0 compatible) through an x8 edge connector. The device can be either a master initiating the PCI Express bus operations or a slave responding to PCI bus operations. The following lists the PCIe interface features:

- PCIe Base 3.0 compliant, 1.1 and 2.0 compatible
- 2.5, 5.0, or 8.0GT/s link rate x8
- Auto-negotiates to x8, x4, x2, or x1
- Support for MSI/MSI-X mechanisms

2.3 I^2C-compatible Interface

A three-pin header on the adapter cards is provided as the I^2C-compatible interface. See Figure 7, "Mechanical Drawing of the Single-port MCX341A Mezzanine Card," on page 45 for the location on the board.

2.4 LED Interface

There are two I/O LEDs per port. For LED specifications please refer to Section 7.4, "Adapter LED Operation," on page 48.

2.5 Unified Extensible Firmware Interface (UEFI)

The UEFI driver is located on the device option ROM and can be used for network boot (for example remote OS installation).

3 Hardware Installation

3.1 System Requirements

3.1.1 Hardware

This card requires a PCI Express connector as specified in the Open Compute Project Intel Motherboard spec v2.0.

3.1.2 Operating Systems/Distributions

Please refer to Section 1.3, “Operating Systems/Distributions,” on page 14.

3.1.3 Software Stacks

Mellanox OpenFabric software package - MLNX_EN for Linux, WinOF for Windows and ESX 5.1 for VMware. See Chapter 4, “Driver Installation”.

3.2 Safety Precautions

The adapter is being installed in a system that operates with voltages that can be lethal. Before opening the case of the system, observe the following precautions to avoid injury and prevent damage to system components.

1. Remove any metallic objects from your hands and wrists.
2. Make sure to use only insulated tools.
3. Verify that the system is powered off and is unplugged.
4. It is strongly recommended to use an ESD strap or other antistatic devices.

3.3 Pre-installation Checklist

1. Verify that your system meets the hardware and software requirements stated above.
2. Shut down your system if active.
3. After shutting down the system, turn off power and unplug the cord.
4. Remove the card from its package. Please note that the card must be placed on an antistatic surface.
5. Check the card for visible signs of damage. Do not attempt to install the card if damaged.

3.4 Card Installation Instructions

It is recommended to support the cards SFP cages with a front bezel to protect against improper insertions and extractions of cables. See Appendix A, “Bezel Assembly (Optional),” on page 49.

1. Before installing the card, make sure that the system is off and the power cord is not connected to the server. Please follow proper electrical grounding procedures.

2. Place the card in an available connector.

Figure 1: Connector on Motherboard

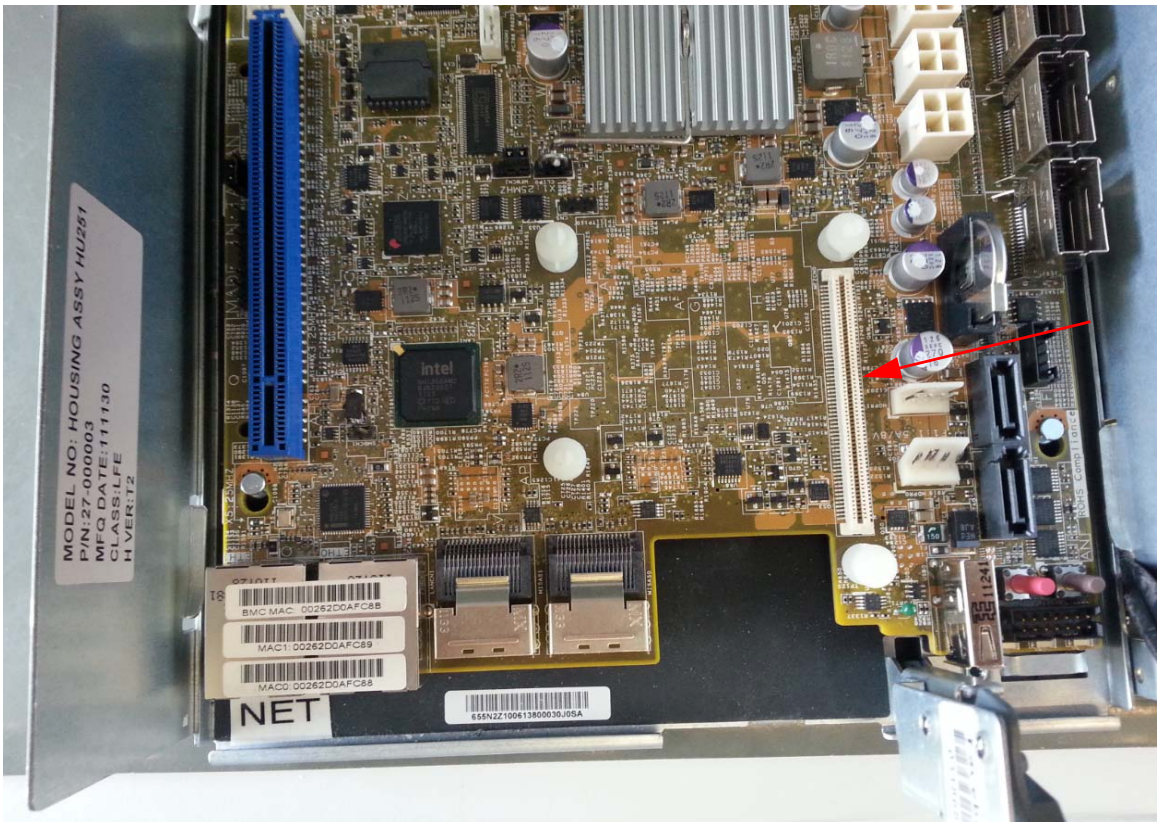
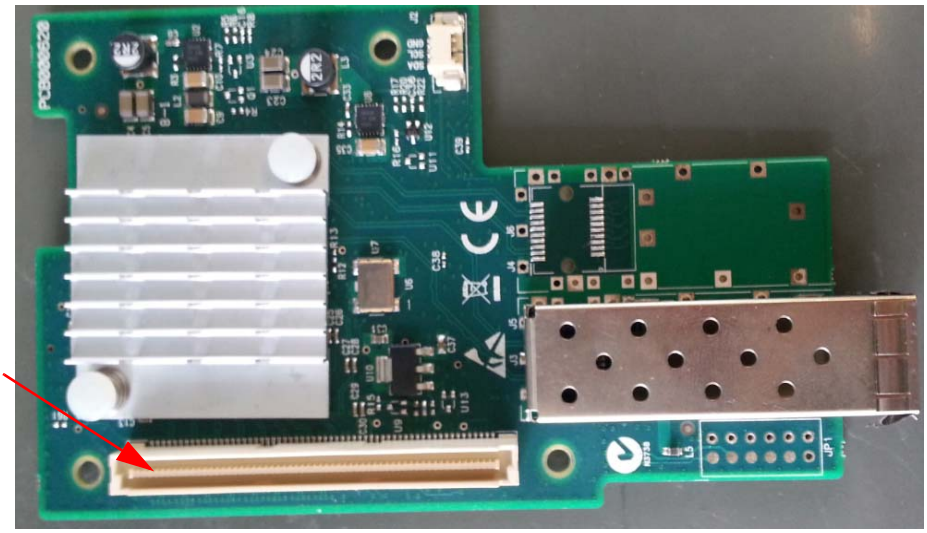
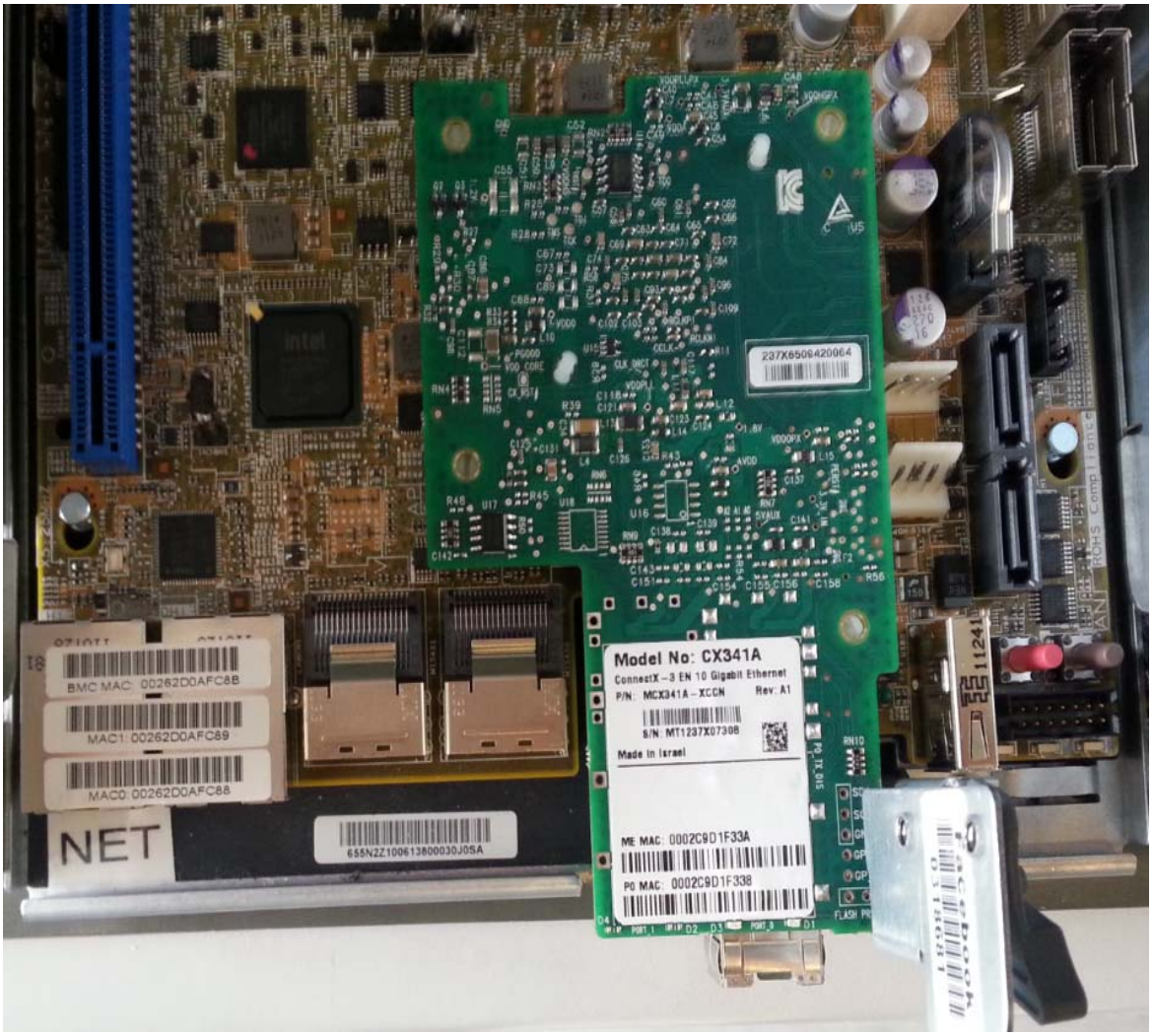


Figure 2: Connector on Card



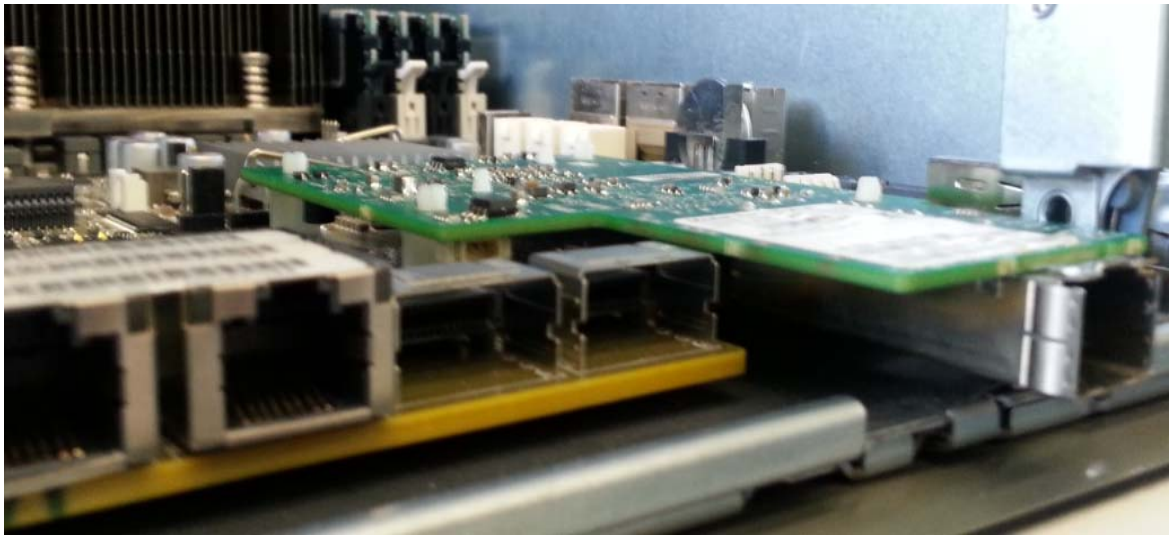
3. Make sure to align the holes of the cards on all four corners with the standoffs on the board.

Figure 3: Standoffs



4. Push down the card into the connector until it is firmly seated. The standoffs must go through the available holes on the card.

Figure 4: Card Installed



3.5 Cables and Modules

The SFP+ port can connect to the Ethernet through both direct attach cables and stand alone transceivers with optical cables. SFP+ transceiver modules are available for both SR and LR protocols.

Note: In order to support SFP+ transceiver modules, the host must supply 3.3Vaux = 3.3V -3% / +5%, or use 3.3V -7% tolerant modules.

To obtain the list of supported cables for your adapter, please refer to “Mellanox Products Approved Cable Lists” at:

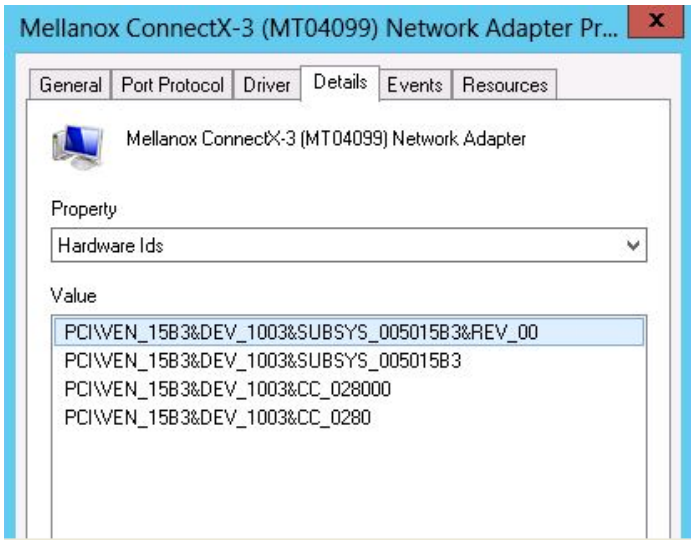
www.mellanox.com/related-docs/user_manuals/Mellanox_approved_cables.pdf.

3.6 Identify the Card in Your System

3.6.1 On Windows

1. Open Device Manager on the server. Click start => Run, and then enter “devmgmt.msc”.
2. Expand System Devices and locate your Mellanox ConnectX-3 adapter card.
3. Right click the mouse on your adapter's row and select properties to display the adapter card properties window.
4. Click the Details tab and select Device Instance Id (Windows 2003).
5. Hardware Ids (Windows 2008/R2) from the Properties pull-down menu.

Figure 5: PCI Device



6. In the Value display box, check the fields VEN and DEV (fields are separated by '&'). In the display example above, notice the sub-string "PCI\VEN_15B3&DEV_1003": VEN is equal to 0x15B3 – this is the Vendor ID of Mellanox Technologies; and DEV is equal to 1003 – this is a valid Mellanox Technologies PCI Device ID.

If the PCI device does not have a Mellanox adapter ID, return to Step 2 to check another device.

The list of Mellanox Technologies PCI Device IDs can be found in the PCI ID repository at http://pci-ids.ucw.cz/read/PC/15b3.

3.6.2 On Linux

Get the device location on the PCI bus by running lspci and locating lines with the string "Mellanox Technologies":

```
> lspci |grep -i Mellanox

27:00.0 Network controller: Mellanox Technologies MT27500 Family [ConnectX-3]
```

4 Driver Installation

4.1 Linux Driver

For Linux, download and install the latest MLNX_EN driver software package available via the Mellanox web site at: http://www.mellanox.com => Products => Software => Ethernet Drivers => ConnectX®-3 EN 10GigE Linux Driver => Download. Follow the installation instructions included in the download package (also available from the download page).

4.1.1 Hardware and Software Requirements

Table 6 - Software and Hardware Requirements

Requirements	Description
Platforms	CPU architectures: • x86_64 • x86 • power-pc
Device ID	For the latest list of device IDs, please visit http://pci-ids.ucw.cz/read/PC/15b3.
Operating System	Linux Operating Systems: • RedHat EL5.8 • RedHat EL5.9 • RedHat EL6.2 • RedHat EL6.3 • OEL6.2 + 2.6.32-279.19.1 • OEL6.3 + 2.6.32-279.19.1 • SLES11 SP1 • SLES11 SP2
Software Dependencies	To install the driver software, kernel sources must be installed on the machine. MLNX_EN driver cannot coexist with OFED software on the same machine. Hence when installing MLNX_EN all OFED packages should be removed (done by the mlnx_en install script)

4.1.2 Installing the Driver

Step 1. Download Driver Package

Please download the current driver package from http://www.mellanox.com => Products => Software => Ethernet Driver => Linux Driver => Download.

Step 2. Install Driver

Run the following commands to install the driver:

```
#> tar xzvf mlnx_en-1.5.10.tgz file
#> cd mlnx_en-1.5.10
#> ./install.sh
```

The package consists of several source RPMs. The install script rebuilds the source RPMs and then installs the created binary RPMs. The created kernel module binaries are placed under /lib/

modules/<kernel-ver>/updates/kernel/drivers/net/mlx4. mlnx_en installer supports 2 modes of installation.The install scripts selects the mode of driver installation depending of the running OS/kernel version.

1. Kernel Module Packaging (KMP) mode, where the source rpm is rebuilt for each installed flavor of the kernel. This mode is used for RedHat and SUSE distributions.
2. Non KMP installation mode, where the sources are rebuilt with the running kernel. This mode is used for vanilla kernels.

Note: If the Vanilla kernel is installed as rpm, please use the "--disable-kmp" flag when installing the driver.

The kernel module sources are placed under /usr/src/mellanox-mlnx-en-1.5.10/.Run the following commands to recompile the driver:

```
#> cd /usr/src/mellanox-mlnx-en-1.5.10/
#> scripts/mlnx_en_patch.sh
#> make
#> make install
```

The uninstall and performance tuning scripts are installed.

Note: If the driver was installed without kmp support, the sources would be located under /usr/srs/mlnx_en-1.5.10/

4.1.3 Loading the Driver

Step 1. Make sure no previous driver version is currently loaded

Run:

```
#> modprobe -r mlx4_en
```

Step 2. Load the new driver version

Run:

```
#> modprobe mlx4_en
```

The result is a new net-device appearing in 'ifconfig -a' output.

4.1.4 Unloading the Driver

To unload the Ethernet driver run:

```
#> modprobe mlx4_en
```

4.1.5 Uninstalling the Driver

To uninstall the mlnx_en driver run:

```
#> /sbin/mlnx_en_uninstall.sh
```

4.2 Windows Driver

For Windows, download and install the latest Mellanox WinOF VPI for Windows software package available via the Mellanox web site at: http://www.mellanox.com=> Products => Software

=> Ethernet Drivers => Windows SW/Driver => Download. Follow the installation instructions included in the download package (also available from the download page).

4.2.1 Hardware and Software Requirements

Table 7 - Software and Hardware Requirements

Requirements	Description
Required Disk Space for Installation	100 MB
Operating Systems	Windows Server 2012 (64 bit only) Windows Server 2008 R2 (64 bit only)
Installer Privileges	The installation requires administrator privileges on the target machine.

4.2.2 Downloading MLNX_WinOF

Follow these steps to download the .exe according to your Operating System.

Step 1. Verify the machine architecture.

1. Open a CMD console (Click start-->Run and enter CMD).

2. Enter the following command:

```
> echo %PROCESSOR_ARCHITECTURE%
```

On an x64 (64-bit) machine, the output will be “AMD64”.

Step 2. Go to the MLNX_WinOF for Windows Web page at http://www.mellanox.com => Products => Software => Ethernet Drivers => Windows SW/Drivers.

Step 3. Download the .exe image according to the architecture of your machine (see Step 1.). The name of the .exe is in the following format MLNX_VPI_WinOF-<version>_All_<OS>_<arch>.exe.

Installing the incorrect .exe file is prohibited. If you do so, an error message will be displayed.
For example, if you try to install a 64-bit .exe on a 32-bit machine, the wizard will display the following (or a similar) error message:

4.2.3 Extracting Files Without Running Installation

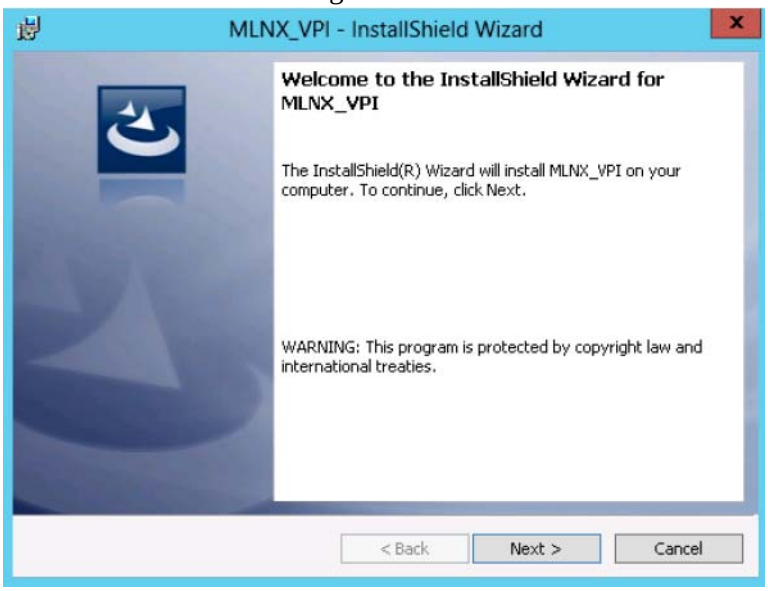
To extract the files without running installation, perform the following steps.

Step 1. Open a CMD console (Click Start-->Run and enter CMD).

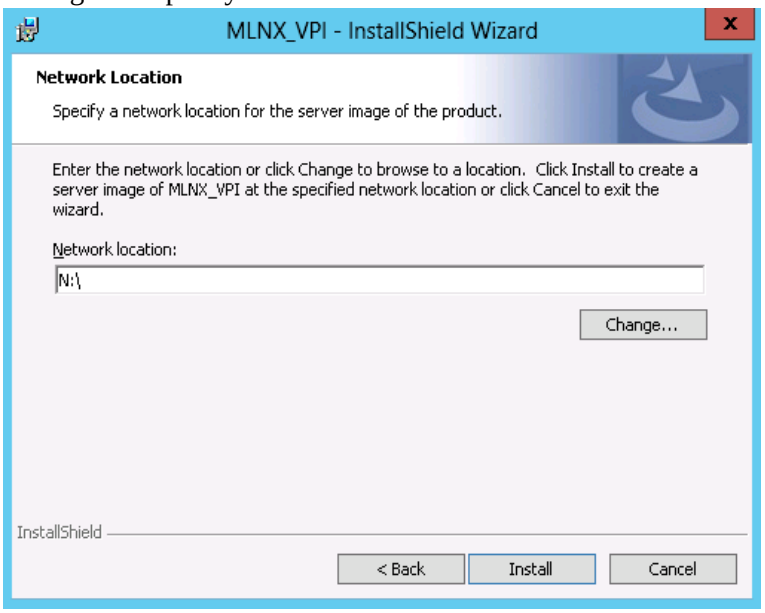
Step 2. Enter the following command:

```
MLNX_VPI_WinOF-<version>_All_<OS>_<arch>.exe /a
```

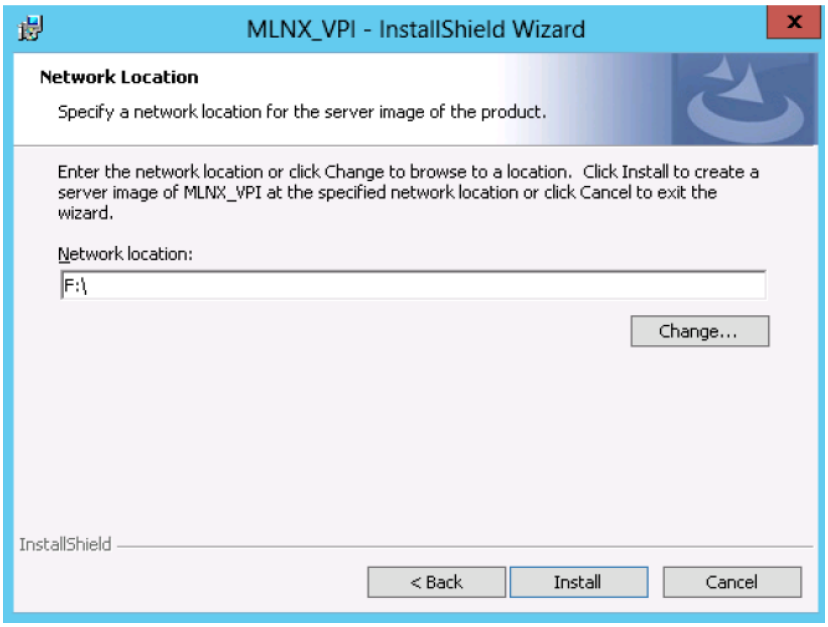
Step 3. Click Next to create a server image.


MLNX_VPI - InstallShield Wizard
Welcome to the InstallShield Wizard for MLNX_VPI
The InstallShield(R) Wizard will install MLNX_VPI on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

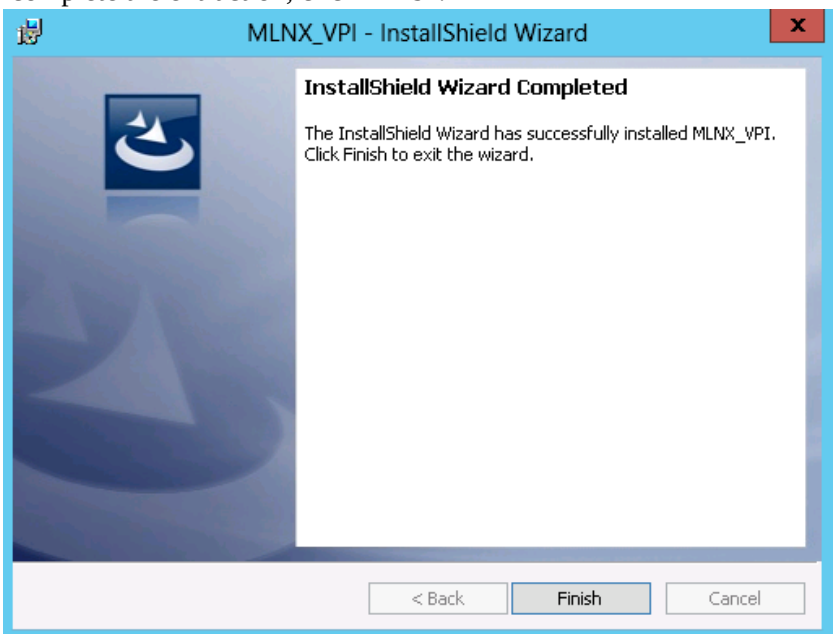
Step 4. Click Change and specify the location in which the files are extracted to.


MLNX_VPI - InstallShield Wizard
Network Location
Specify a network location for the server image of the product.
Enter the network location or click Change to browse to a location. Click Install to create a server image of MLNX_VPI at the specified network location or click Cancel to exit the wizard.
Network location:
N:\
Change...
InstallShield
< Back
Install
Cancel

Step 5. Click Install to extract this folder, or click Change to install to a different folder.


MLNX_VPI - InstallShield Wizard
Network Location
Specify a network location for the server image of the product.
Enter the network location or click Change to browse to a location. Click Install to create a server image of MLNX_VPI at the specified network location or click Cancel to exit the wizard.
Network location:
F:\
Change...
InstallShield
< Back
Install
Cancel

Step 6. To complete the extraction, click Finish.


MLNX_VPI - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed MLNX_VPI. Click Finish to exit the wizard.
< Back
Finish
Cancel

4.2.4 Installing MLNX_WinOF

This section provides instructions for two types of installation procedures:

- "Attended Installation"

  An installation procedure that requires frequent user intervention.

- "Unattended Installation"

An automated installation procedure that requires no user intervention.

Both Attended and Unattended installations require administrator privileges.

4.2.4.1 Attended Installation

The following is an example of a MLNX_WinOF_win8 x64 installation session.

Step 1. Double click the .exe and follow the GUI instructions to install MLNX_WinOF.

To configure your setup to contain the logs option, please run the following command after opening a CMD console:

```
MLNX_VPI_WinOF-4_40_0_All_win8_x64.exe /v"/l*vx [LogFile]"
```

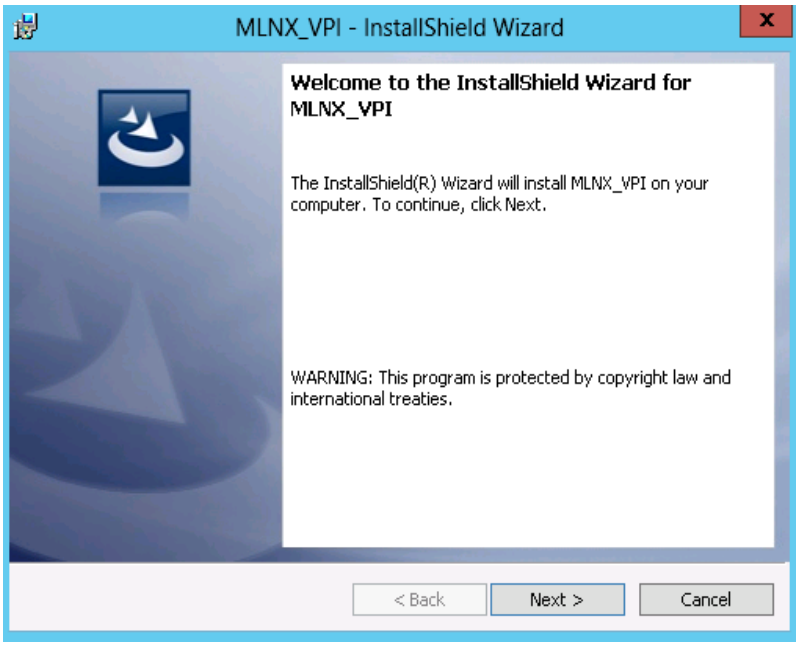
If you do not want to upgrade your firmware version, run the following command:

```
MLNX_VPI_WinOF-4_40_0_All_win8_x64.exe /v" MT_SKIPFWUPGRD=1"
```

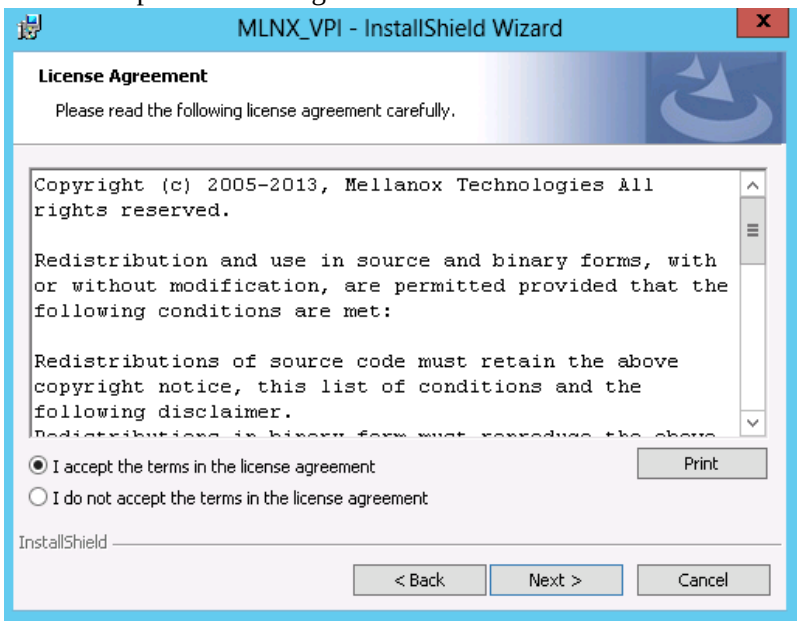
For further help, please run:

```
MLNX_VPI_WinOF-4_40_0_All_win8_x64.exe /v" /h"
```

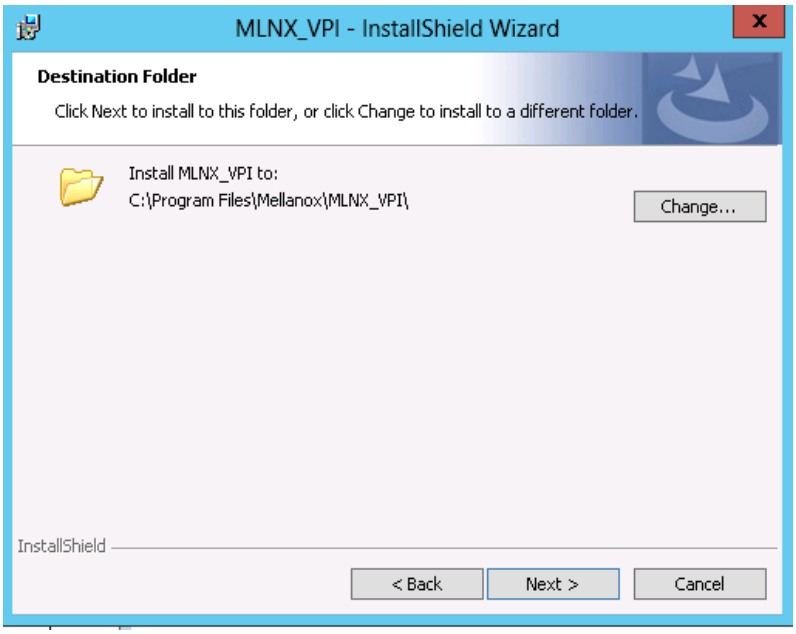
Step 2. Click Next in the Welcome screen.


MLNX_VPI - InstallShield Wizard
Welcome to the InstallShield Wizard for MLNX_VPI
The InstallShield(R) Wizard will install MLNX_VPI on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

Step 3. Read then accept the license agreement and click Next.


MLNX_VPI - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
Copyright (c) 2005-2013, Mellanox Technologies All rights reserved.
Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:
Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

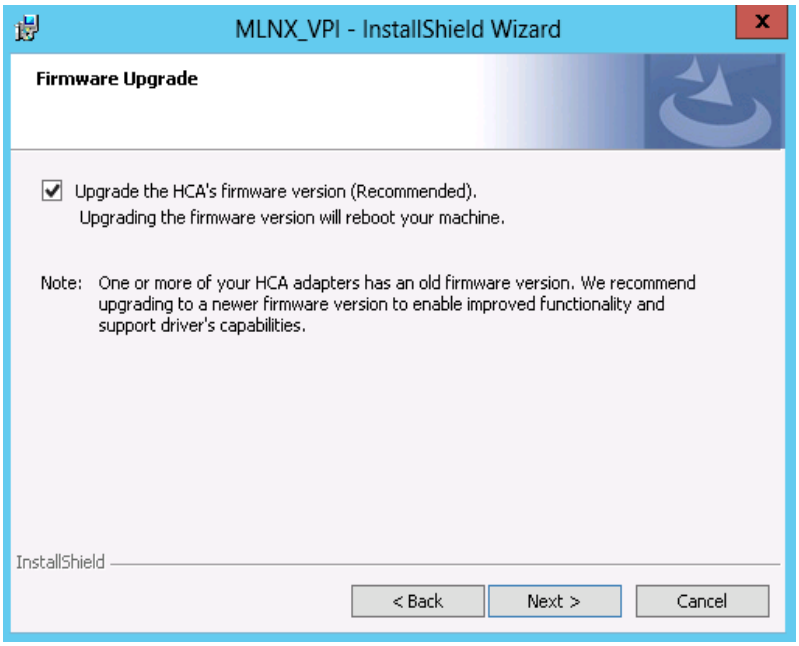
Step 4. Select the target folder for the installation.



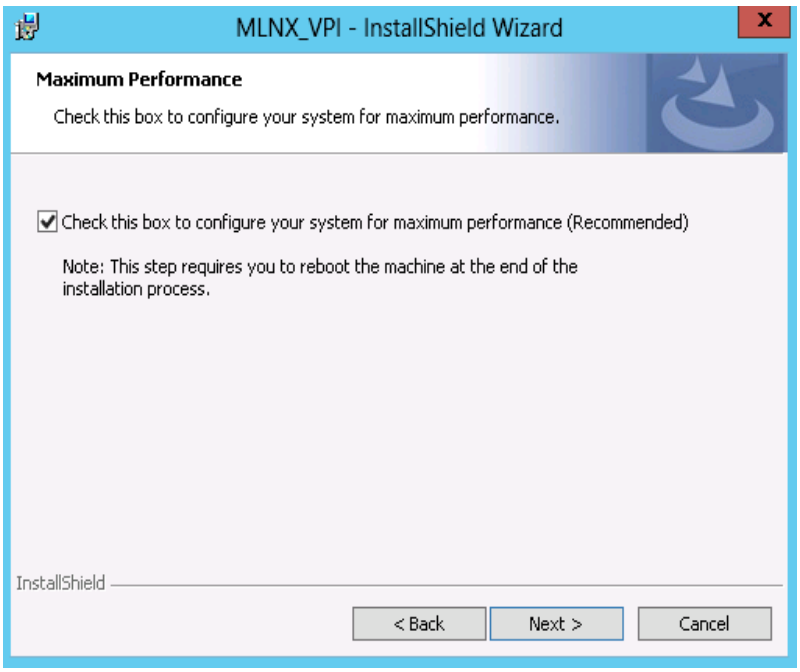
Step 5. The firmware upgrade screen will be displayed in the following cases:

- If the user has an OEM card, in this case the firmware will not be updated.

- If the user has a standard Mellanox card, and the firmware version is older than the one specified in WinOF Installation Guide 4.40, the firmware will be updated accordingly. However, if the user has both OEM card and Mellanox card, only Mellanox card will be updated.

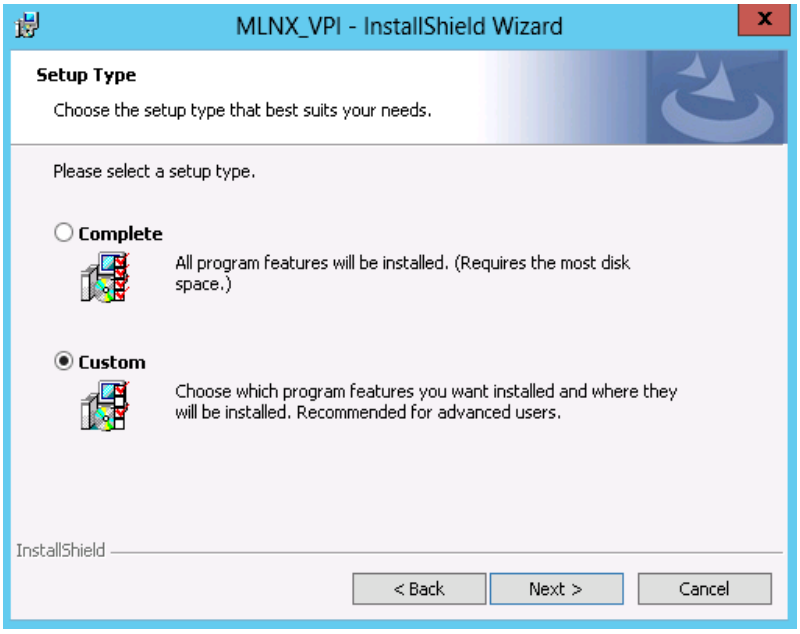

MLNX_VPI - InstallShield Wizard
Firmware Upgrade
Upgrade the HCA's firmware version (Recommended).
Upgrading the firmware version will reboot your machine.
Note: One or more of your HCA adapters has an old firmware version. We recommend upgrading to a newer firmware version to enable improved functionality and support driver's capabilities.
InstallShield
< Back
Next >
Cancel

Step 6. Configure your system for maximum performance by checking the maximum performance box.


MLNX_VPI - InstallShield Wizard
Maximum Performance
Check this box to configure your system for maximum performance.
Check this box to configure your system for maximum performance (Recommended)
Note: This step requires you to reboot the machine at the end of the installation process.
InstallShield
< Back
Next >
Cancel

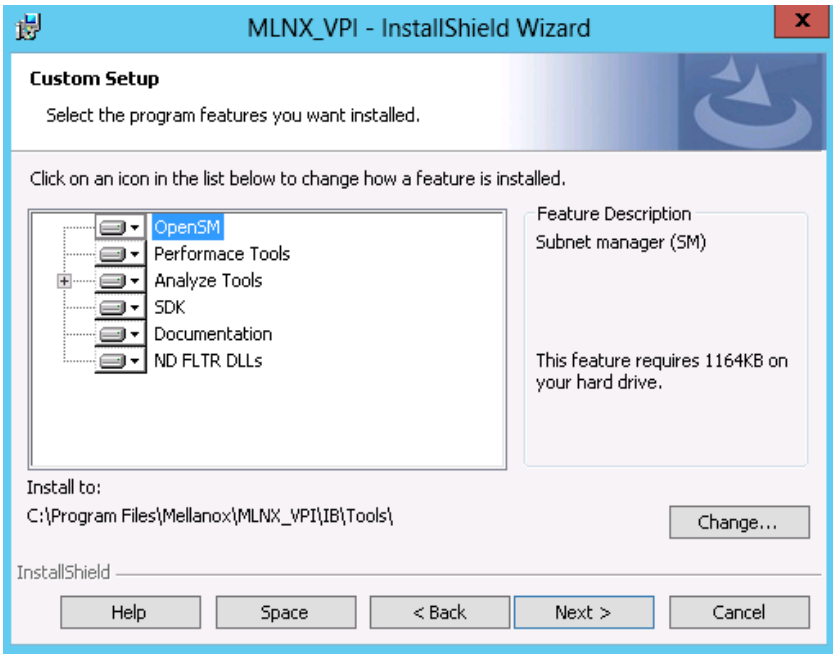
This step requires rebooting your machine at the end of the installation.

Step 7. Select a Complete or Custom installation, follow Step a and on, on page 29.

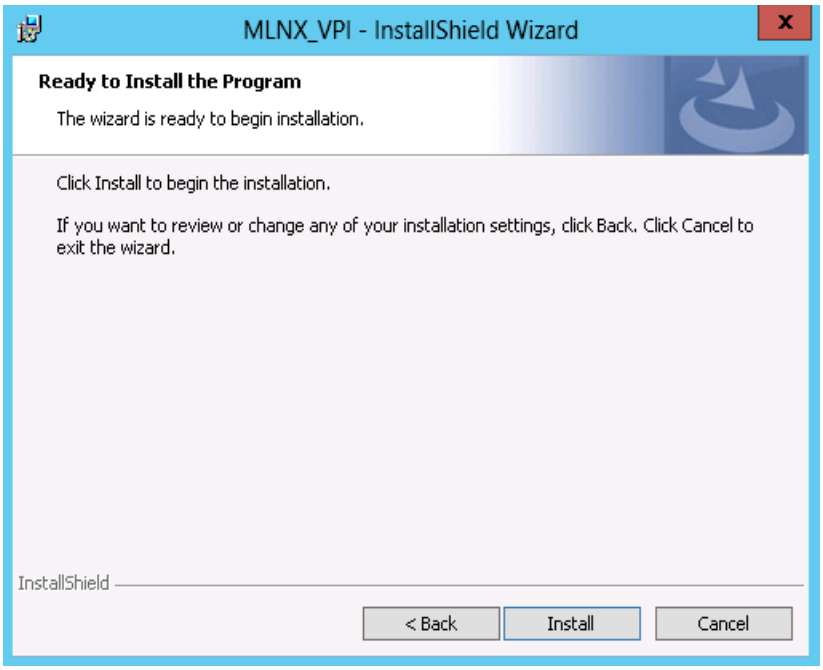

MLNX_VPI - InstallShield Wizard
Setup Type
Choose the setup type that best suits your needs.
Please select a setup type.
Complete
All program features will be installed. (Requires the most disk space.)
Custom
Choose which program features you want installed and where they will be installed. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel

a. Select the desired feature to install:

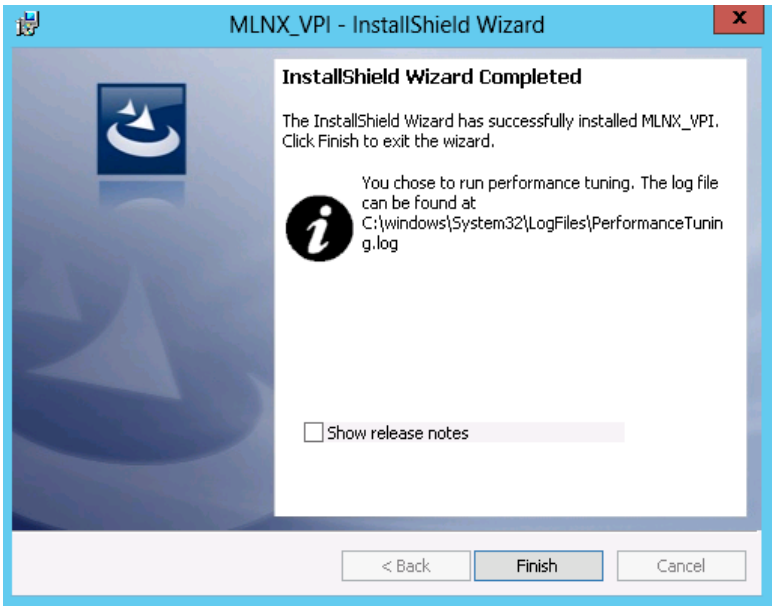
- OpenSM - installs Windows OpenSM that is required to mange the subnet from a host. OpenSM is part of the driver and installed automatically.
- Performances tools - install the performance tools that are used to measure the InfiniBand performance in user environment.
- Analyze tools - install the tools that can be used either to diagnosed or analyzed the Infini-Band environment.
- SDK - contains the libraries and DLLs for developing InfiniBand application over IBAL.
- Documentation: contains the User Manual and Installation Guide.
- ND FLTR DLLs: contains the files for standalone installation of the mlx4nd provider.



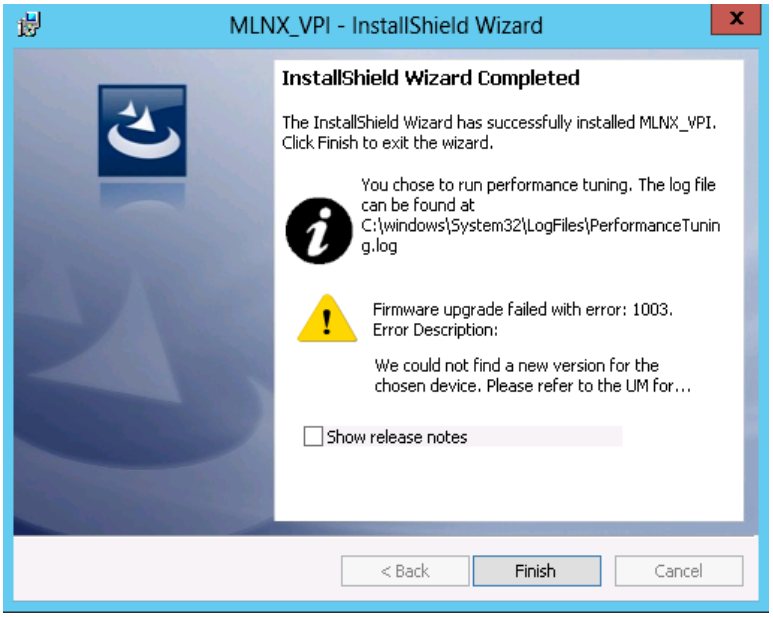
b. Click Install to start the installation.


MLNX_VPI - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

Step 8. Click Finish to complete the installation.


MLNX_VPI - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed MLNX_VPI. Click Finish to exit the wizard.
You chose to run performance tuning. The log file can be found at C:\windows\System32\LogFiles\PerformanceTuning.log
Show release notes
< Back
Finish
Cancel

If the firmware upgrade fails, the following message will be displayed.


MLNX_VPI - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed MLNX_VPI. Click Finish to exit the wizard.
You chose to run performance tuning. The log file can be found at C:\windows\System32\LogFiles\PerformanceTuning.log
Firmware upgrade failed with error: 1003.
Error Description:
We could not find a new version for the chosen device. Please refer to the UM for...
Show release notes
< Back
Finish
Cancel

4.2.4.2 Unattended Installation

The following is an example of a MLNX_WinOF_win8 x64 unattended installation session.

Step 1. Open the CMD console (click Start > Run and enter ‘cmd’)

Step 2. Install the driver. Run:

```
> MLNX_VPI_WinOF-4_40_0_All_win8_x64.exe /S /v"/qn"
```

Step 3. [Optional] To configure your setup to contain the logs option, please run the following command:

```
> MLNX_VPI_WinOF-4_40_0_All_win8_x64.exe /S /v"/qn" /v"/l*vx [LogFile]"
```

Step 4. [Optional] If you do not want to upgrade your firmware version, run the following command:

```
> MLNX_VPI_WinOF-4_40_0_All_win8_x64.exe /S /v"/qn" /v" MT_SKIPFWUPGRD=1"
```

For further help, please run:

```
> MLNX_VPI_WinOF-4_40_0_All_win8_x64.exe /v" /h"
```

4.2.5 Upgrading MLNX_WinOF

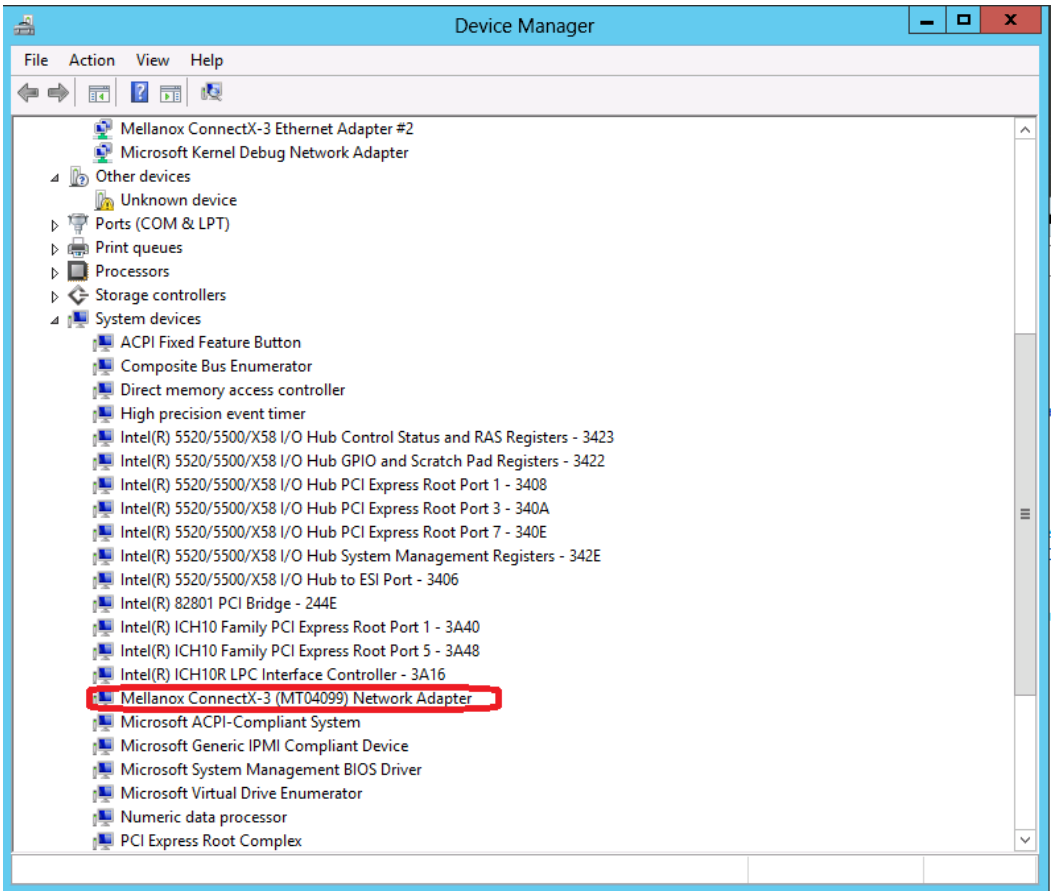
The MLNX_WinOF driver upgrades automatically MLNX_WinOF Windows 2008R2 driver by uninstalling the previous version and installs the new driver. However, MLNX_WinOF driver upgrade in Windows 2012 driver do not completely uninstall the previous version.

- In Windows 2012 (MLNX_WinOF Rev. 4.2 and above), the network configuration is saved upon driver upgrade.
- In Windows 2008 R2 the existing configuration files are not saved upon driver upgrade.

4.2.6 Installation Results

Upon installation completion, you can verify the successful addition of the network card(s) through the Device Manager. To see the Mellanox network adapter device, and the Ethernet or IPoIB network device (depending on the used card) for each port, display the Device Manager and expand “System devices” or “Network adapters”.

.


Device Manager
File Action View Help
Mellanox ConnectX-3 Ethernet Adapter #2
Microsoft Kernel Debug Network Adapter
Other devices
Unknown device
Ports (COM & LPT)
Print queues
Processors
Storage controllers
System devices
ACPI Fixed Feature Button
Composite Bus Enumerator
Direct memory access controller
High precision event timer
Intel(R) 5520/5500/X58 I/O Hub Control Status and RAS Registers - 3423
Intel(R) 5520/5500/X58 I/O Hub GPIO and Scratch Pad Registers - 3422
Intel(R) 5520/5500/X58 I/O Hub PCI Express Root Port 1 - 3408
Intel(R) 5520/5500/X58 I/O Hub PCI Express Root Port 3 - 340A
Intel(R) 5520/5500/X58 I/O Hub PCI Express Root Port 7 - 340E
Intel(R) 5520/5500/X58 I/O Hub System Management Registers - 342E
Intel(R) 5520/5500/X58 I/O Hub to ESI Port - 3406
Intel(R) 82801 PCI Bridge - 244E
Intel(R) ICH10 Family PCI Express Root Port 1 - 3A40
Intel(R) ICH10 Family PCI Express Root Port 5 - 3A48
Intel(R) ICH10R LPC Interface Controller - 3A16
Mellanox ConnectX-3 (MT04099) Network Adapter
Microsoft ACPI-Compliant System
Microsoft Generic IPMI Compliant Device
Microsoft System Management BIOS Driver
Microsoft Virtual Drive Enumerator
Numeric data processor
PCI Express Root Complex

4.2.7 OpenSM Activation

OpenSM is a service required by managed networks in InfiniBand environments, and must be activated in one of the machines running on the subnet, otherwise the interface link will not come up. If the cards are connected to a managed network, there is no need to run OpenSM. Only one OpenSM should run per subnet.

In Ethernet interfaces, running OpenSM is not required.

OpenSM does not run as a service during installation as it requires the GUID parameter to decide on which port to work. Setting OpenSM upon setup results in it working only for the first port and not for the others.

- ***To run OpenSM as a service, assuming the package was installed in the default path, use:***

```
sc create OpenSM1 binPath= "c:\Program Files\Mellanox\MLNX_VPI\IB\Tools\
opensm.exe --service" start=auto"
```

- ***To start the service, run:***

```
sc start opensm
```

For further information, please refer to the “OpenSM - Subnet Manager” chapter in the User Manual.

4.2.8 Uninstalling MLNX_WinOF

4.2.8.1 Attended Uninstall

➢ ***To uninstall MLNX_WinOF on a single node, perform one of the following options:***

1. Click Start-> Control Panel-> Programs and Features-> MLNX_VPI-> Uninstall. (NOTE: This requires elevated administrator privileges.)
2. Double click the .exe and follow the instructions of the install wizard.
3. Click Start-> All Programs-> Mellanox Technologies-> MLNX_WinOF-> Uninstall MLNX_WinOF.

4.2.8.2 Unattended Uninstall

➢ ***To uninstall MLNX_WinOF in unattended mode, perform the following:***

Step 1. Open a CMD console.

Step 2. Uninstall the driver. Run:

```
MLNX_VPI_WinOF-4_40_0_All_win8_x64.exe /S /x /v"/qn"
```

4.2.9 Assigning Port IP After Installation

By default, your machine is configured to obtain an automatic IP address via a DHCP server. In some cases, the DHCP server may require the MAC address of the network adapter installed in your machine.

➢ ***To obtain the MAC address:***

Step 1. Open a CMD console

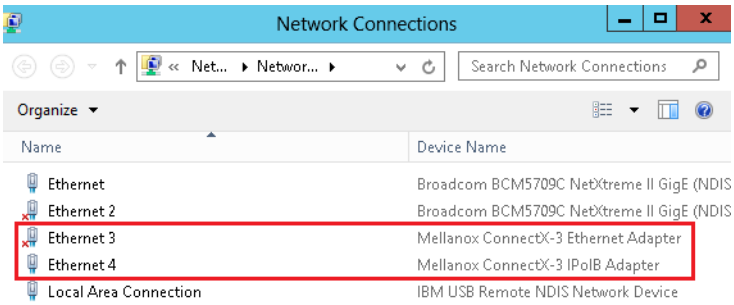
Step 2. Display the MAC address as “Physical Address”

```
ipconfig /all
```

Configuring a static IP is the same for both IPoIB and Ethernet adapters.

➢ ***To assign a static IP address to a network port after installation:***

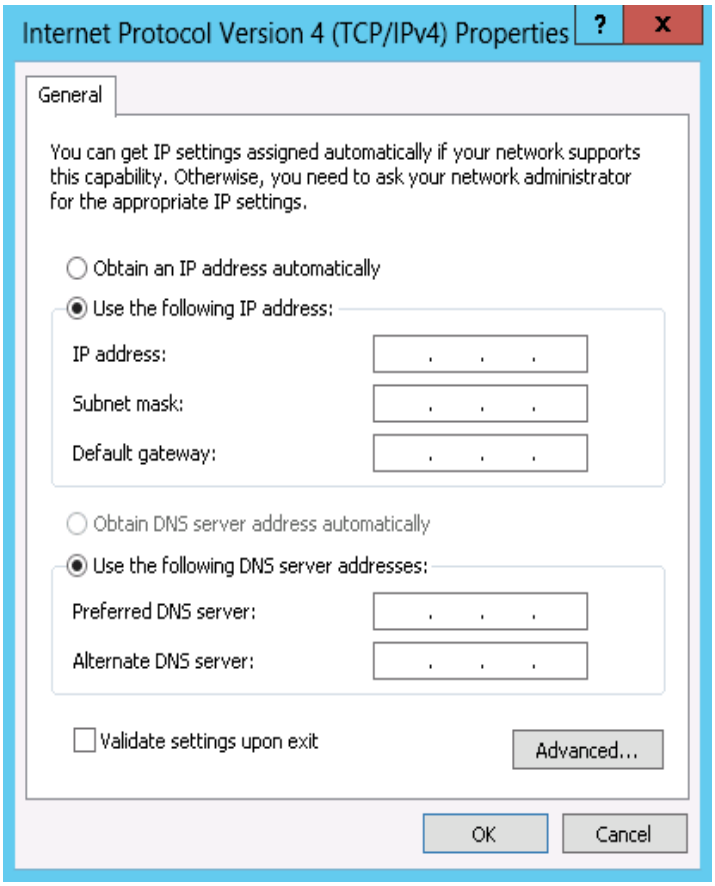
Step 1. Open the Network Connections window. Locate Local Area Connections with Mellanox devices.



Step 2. Right-click a Mellanox Local Area Connection and left-click Properties.

Step 3. Select Internet Protocol Version 4 (TCP/IPv4) from the scroll list and click Properties.

Step 4. Select the “Use the following IP address:” radio button and enter the desired IP information.


Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

Step 5. Click OK.

Step 6. Close the Local Area Connection dialog.

Step 7. Verify the IP configuration by running ‘ipconfig’ from a CMD console.

```
> ipconfig
...
Ethernet adapter Local Area Connection 4:

   Connection-specific DNS Suffix  . :
   IP Address. . . . . . . . . . . . : 11.4.12.63
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . :
...
```

4.3 VMware Driver

For VMware download and install the latest Mellanox OFED Driver for VMware® ESXi Server-software package available via the Mellanox web site at: http://www.mellanox.com => Products => Software => Ethernet Drivers => VMware Drivers => Download. Follow the installation instructions included in the download package (also available from the download page).

4.3.1 Installing and Running the VBI Driver on ESXi-5.x

1. Log into the VMware ESXi server machine as root.
2. You can either:
   a. Remove any earlier version of the driver from your VMware ESXi server machine prior to installing the new version. Run:

```
#> esxcli software vib list
#> esxcli software vib remove -n net-mlx4-en
```

   b. Install the mlx4_en driver VIB package. Run:

```
#> esxcli software vib install -v <vib_url>
```

   c. Reboot ESXi server (The driver will be loaded automatically).

   OR

   a. Update the driver. Run:

```
#> esxcli software vib update -v <vib_url>
```

   b. Reboot ESXi server (The driver will be loaded automatically).

» ***To verify that the driver is loaded, run:***

```
#> vmkload_mod -l | grep mlx4_en
```

» ***To query network uplinks installed on your machine, run:***

```
#> esxcli network nic list
```

The number of uplinks claimed by MLX4_EN driver should be displayed.

In Non Multifunction Mode, port 2 is identified as a pseudo device. Therefore devices are not seen by vSphere when added as uplink.

For further information on how to manipulate the uplink, please refer to Section 5.3, “Adding the Device as an uplink to an Existing Vswitch using the CLI,” on page 10 of the VMware User Manual. See Table 2, “Documents List,” on page 9.

4.3.2 Installing and Running the offline_bundle Driver on ESXi-5.x

1. Copy the offline_bundle zip file to ESXi 5.0 machine and extract its contents.
2. You can install the driver in one of the following ways:
   a. Remove any earlier version of the driver from your VMware ESXi server machine prior to installing the new version. Run:

```
#> esxcli software vib list
#> esxcli software vib remove -n net-mlx4-en
```

   b. Install the mlx4_en driver offline_bundle package. Run:

```
#> esxcli software vib install -d
<path>/mlx4_en-mlnx-1.6.1.2-offline_bundle-471530.zip
```

   c. Reboot ESXi server. (The driver will be loaded automatically).

   OR

a. Update the driver. Run:

```
#> esxcli software vib update -n net-mlx4-en -d
<path>/mlx4_en-mlnx-1.6.1.2-offline_bundle-471530.zip
```

b. Reboot ESXi server. (The driver will be loaded automatically).

» ***To verify that the driver is loaded, run:***

```
#> vmkload_mod -l | grep mlx4_en
```

» ***To query network uplinks installed on your machine, run:***

```
#> esxcli network nic list
```

The number of uplinks claimed by MLX4_EN driver should be displayed.

In Non Multifunction Mode, port 2 is identified as a pseudo device. Therefore devices are not seen by vSphere when added as uplink.

For further information on how to manipulate the uplink, please refer to Section 5.3, “Adding the Device as an uplink to an Existing Vswitch using the CLI,” on page 10 of the VMware User Manual. See Table 2, “Documents List,” on page 9.

4.3.3 Removing the VIB/offline_bundle Driver

» ***To remove the VIB/offline_bundle driver package from the ESXi server machine, run:***

```
#> esxcli software vib  remove -n net-mlx4-en
```

4.4 FlexBoot

FlexBoot supports remote Boot over Ethernet. This technology is based on the Preboot Execution Environment (PXE) standard specification, and FlexBoot software is based on the open source iPXE project (see www.ipxe.org). For more information go to http://www.mellanox.com => Products => Software => Ethernet Drivers => Download.

5 Updating Adapter Card Firmware

Each card is shipped with the latest version of qualified firmware at the time of manufacturing. However, Mellanox issues firmware updates occasionally and the most recent firmware can be obtained from: http://www.mellanox.com => Support. Check that the firmware on your card is the latest found on the Mellanox site, if not update to the latest version found on the Mellanox web site.

Firmware can be updated on the stand-alone single card using the **flint** tool of the *Mellanox Firmware Tools (MFT)* package. This package is available for download, along with its user manual, from the Mellanox Firmware Tools page. See http://www.mellanox.com => Software => Firmware Tools.

The following steps describe how to retrieve the PSID (firmware identification) and programmed firmware version of your adapter card. They also describe how to update the card with the latest firmware version available.

1. Retrieve the PSID and firmware version:
   a. Install the MFT package. The package is available at http://www.mellanox.com => Products => Software => Firmware Tools. Make sure to download the package corresponding to your computer's operating system.
   b. Enter: mst start.
   c. Get the Mellanox *mst device name* using the command "mst status". The mst device name will be of the form: /dev/mst/mt4099_pci_cr0.
   d. Get the PSID (firmware identification) and programmed firmware version using the command.

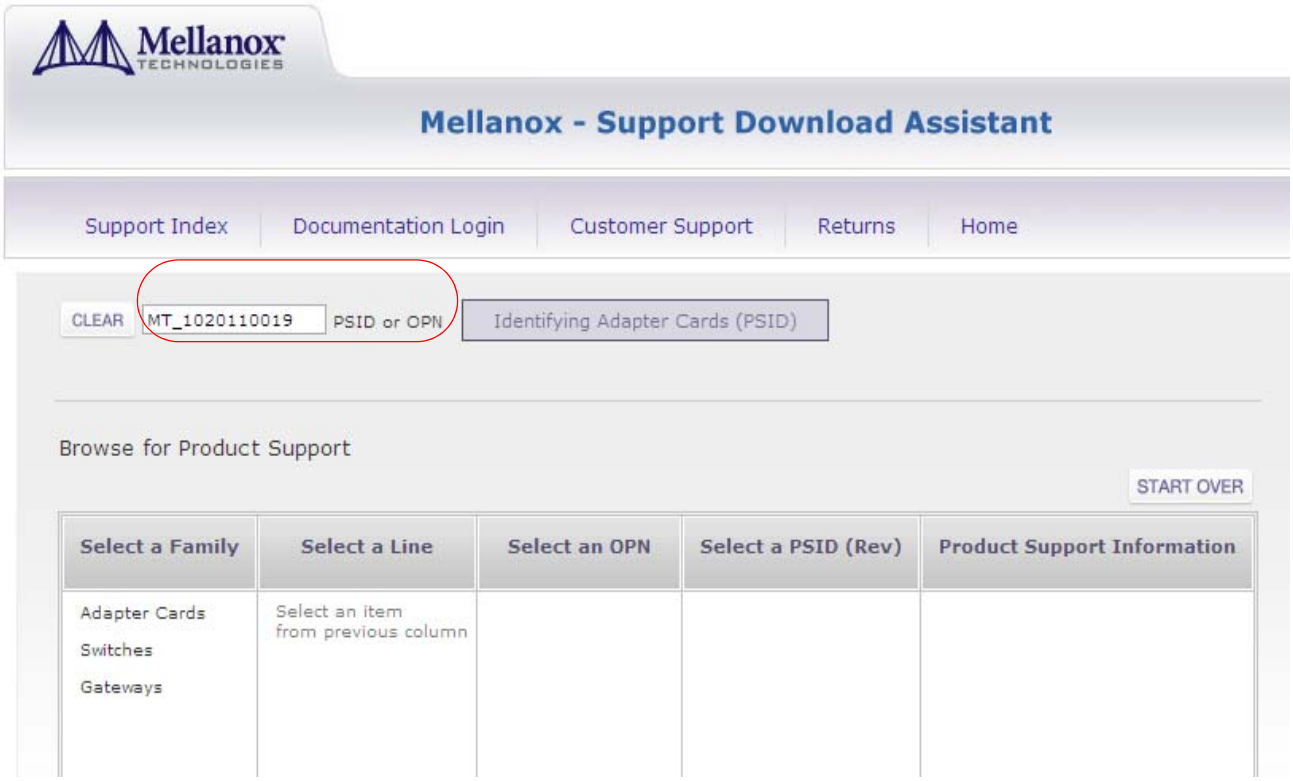
Note: The shown versions and/or parameter values in the example below may not reflect the latest or actual values for this product, and are included here for illustration purposes only.

```
 flint -d /dev/mst/mt4099_pci_cr0 q
 Image type:      ConnectX
 FW Version:      2.30.4260
 Device ID:       4099
 Description:     Node            Port1           Port2
Sys image
 GUIDs:           ffffffffffffffff ffffffffffffffff
ffffffffffffffff ffffffffffffffff
 MACs:                                  0002c9305350
0002c9305351
 VSD:
 PSID:            MT_1080120023
```

1. Compare the programmed firmware version with the latest available.
   a. Go to Mellanox's web site: http://www.mellanox.com/supportdownloader. See Figure 6.
   b. Enter your card PSID to display the latest firmware file. The file name of the binary is composed by combining the firmware name, the firmware release version, and the card part number.

Note: Please contact Mellanox System Support if you cannot find the firmware binary for your adapter card.

Figure 6: Support Download Assistant



1. If a newer firmware version exists for your adapter card on the Web, update the firmware as follows:
   a. Download the firmware (image) zip file from the Support Downloader (see Step 2a above).
   b. Unzip the firmware image.
   c. Burn the firmware image. Enter:

```
> flint -d /dev/mst/mt4099_pci_cr0 -i <binary image> burn
```

   a. Reboot the computer.
   b. Enter: mst start.
   c. Verify that the card firmware was updated successfully.

```
> flint -d /dev/mst/mt4099_pci_cr0  q
Image type:      ConnectX
FW Version:     2.9.4100
Device ID:         4099
...
```

6 Troubleshooting

6.1 General

GUID of ConnectX-3 Ethernet adapter cards	• Please use the GUID value returned by the fabric/driver utilities (not 0xfffff). See Appendix C.1, "Retrieving Adapter Card GUID," on page 55.
Server unable to find the adapter	• Ensure that the adapter is placed correctly • Make sure the adapter slot and the adapter are compatible • Install the adapter in a different PCI Express slot • Use the drivers that came with the adapter or download the latest • Make sure your motherboard has the latest BIOS • Try to reboot the server
The adapter no longer works	• Reseat the adapter in its slot or a different slot, if necessary • Try using another cable • Reinstall the drivers for the network driver files may be damaged or deleted • Reboot the server
Adapters stopped working after installing another adapter	• Try removing and re-installing all adapters • Check that cables are connected properly • Make sure your motherboard has the latest BIOS
Link indicator light is off	• Ensure that adapter driver/s is loaded • Try another port on the switch • Make sure the cable is securely attached • Check your are using the proper cables that do not exceed the recommended lengths • Verify that your switch and adapter port are compatible
Link light is on, but with no communication established	• Check that the latest driver is loaded • Check that both the adapter and its link are set to the same speed and duplex settings

6.2 Linux

Environment Information	cat/etc/issue uname –a cat/proc/cupinfo | grep 'model name' | uniq ofed_info | head -1 ifconfig –a ethtool <interface> ethtool –i <interface_of_Mellanox_port_num> ibdev2netdev
Card Detection	lspci | grep –i Mellanox
Mellanox Firmware Tool (MFT)	Download and install MFT: http://www.mellanox.com/content/pages.php?pg=management_tools&menu_section=34 Refer to the User Manual for installation instructions. Once installed, run: mst start mst status flint –d <mst_device> q
Ports Information	ibstat lbv_devinfo
Firmware Version Upgrade	To download the latest firmware version refer to http://www.mellanox.com/supportdownloader
Collect Log File	/var/log/messages dmesg > system.log**F**

6.3 Windows

Environment Information	From the Windows desktop choose the Start menu and run: msinfo32 To export system information to a text file, choose the Export option from the File menu. Assign a file name and save.
Mellanox Firmware Tool (MFT)	Download and install MFT: http://www.mellanox.com/content/pages.php?pg=management_tools&menu_section=34 Refer to the User Manual for installation instructions. Once installed, open a CMD window and run: cd C:\Program Files\Mellanox\WinMFT mst start mst status flint –d <mst_device> q
Ports Information	vstat
Firmware Version Upgrade	Download the latest firmware version using the PSID/board ID: http://www.mellanox.com/supportdownloader/ flint –d <mst_device> –i <firmware_bin_file> b

Collect log file	• Event log viewer
	• MST device logs:
	  • mst start
	  • mst status
	  • C:\Users\Administrator> flint –d <mst_device> dc > dump_configuration.log
	  • C:\Users\Administrator> mstdump <mst_device> dc > mstdump.log

7 Specifications

7.1 MCX341A Specifications

Table 8 - MCX341A Specifications Table

Physical	**Size:** 2.68in. x 4.3 in. (68mm x 110mm)
	Connector: SFP+ 10Gb/s
Protocol Support	**Ethernet:** 10GBASE-SR, 10GBASE-LR, and 10GBASE-CX
	Data Rate: 1/10Gb/s – Ethernet
	PCI Express Gen3: SERDES @ 8.0GT/s, 8lanes (2.0 and 1.1 compatible)
Power and Environmental	**Voltage:** 5V, 3.3V
	Typ Power: Passive Cables 3.72W
	Max Power: Passive Cables 5.10W
	Max power available through SFP+ port: 1W
	Temperature: Operational: 0°C to 45°C Non-operational: 0°C to 70°C
	Humidity: 90% relative humidity[a]
	Air Flow: 300LFM[b]
Regulatory	**EMC:** Refer to the following link: www.mellanox.com/related-docs/user_manuals/Regulatory_and_Compliance_Guide.pdf
	Safety: IEC/EN 60950-1:2006 ETSI EN 300 019-2-2 IEC 60068-2- 64, 29, 32
	RoHS: RoHS-R6
Cable Support	Please refer to www.mellanox.com => Products => Cables and Transceivers

a. For both operational and non-operational states

b. Air flow is measured ~1” from the Mezz from the cooling air inlet side.

7.2 MCX342A Specifications

Table 9 - MCX342A Specifications Table

Physical	**Size:** 2.68in. x 4.3 in. (68mm x 110mm)
	Connector: SFP+ 10Gb/s
Protocol Support	**Ethernet:** 10GBASE-SR, 10GBASE-LR, and 10GBASE-CX
	Data Rate: 1/10Gb/s – Ethernet
	PCI Express Gen3: SERDES @ 8.0GT/s, 8 lanes (2.0 and 1.1 compatible)
Power and Environmental	**Voltage:** 5V, 3.3V
	Typ Power: Passive Cables 5.09W
	Max Power: Passive Cables 6.38W
	Max power available through SFP+ port: 1W
	Temperature: Operational: 0°C to 45°C Non-operational: 0°C to 70°C
	Humidity: 90% relative humidity[a]
	Air Flow: 300LFM[b]
Regulatory	**EMC:** Refer to the following link: www.mellanox.com/related-docs/user_manuals/Regulatory_and_Compliance_Guide.pdf
	Safety: IEC/EN 60950-1:2006 ETSI EN 300 019-2-2 IEC 60068-2- 64, 29, 32
	RoHS: RoHS-R6
Cable Support	Please refer to www.mellanox.com => Products => Cables and Transceivers

a. For both operational and non-operational states

b. Air flow is measured ~1” from the Mezz from the cooling air inlet side.

7.3 Board Mechanical Drawing and Dimensions

All dimensions are in millimeters.
All the mechanical tolerances are +/- 0.1mm

Figure 7: Mechanical Drawing of the Single-port MCX341A Mezzanine Card

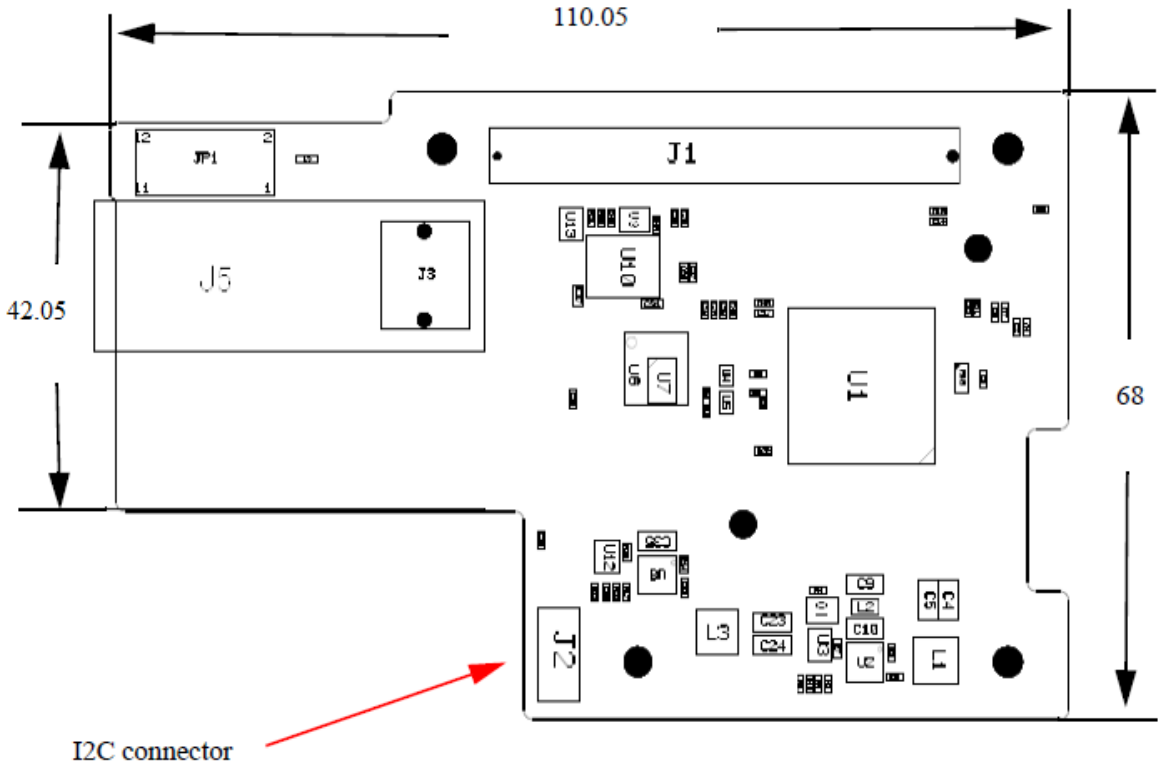
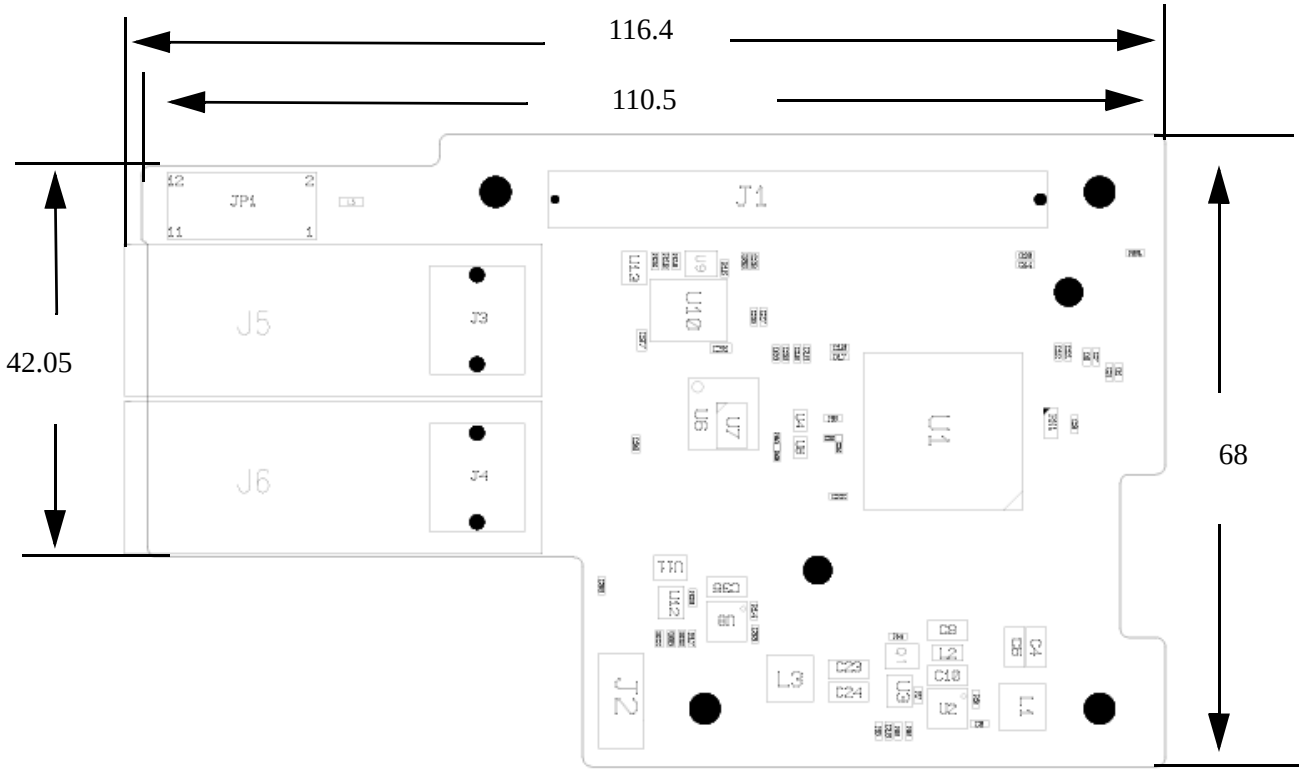


Figure 8: Mechanical Drawing of the Dual-port MCX342A Mezzanine Card



7.3.1 Mylar Mechanical Drawing and Dimensions

Figure 9: Mechanical Drawing of Mylar

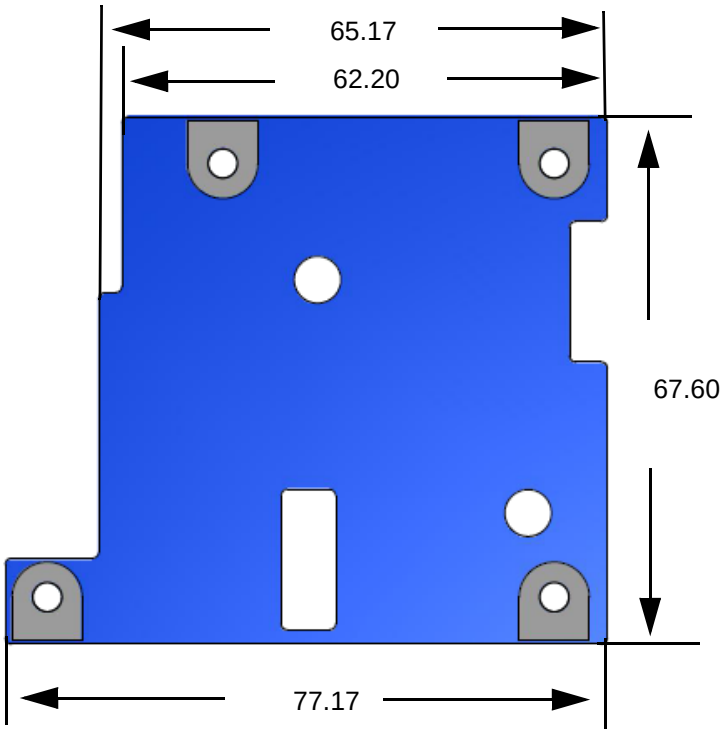
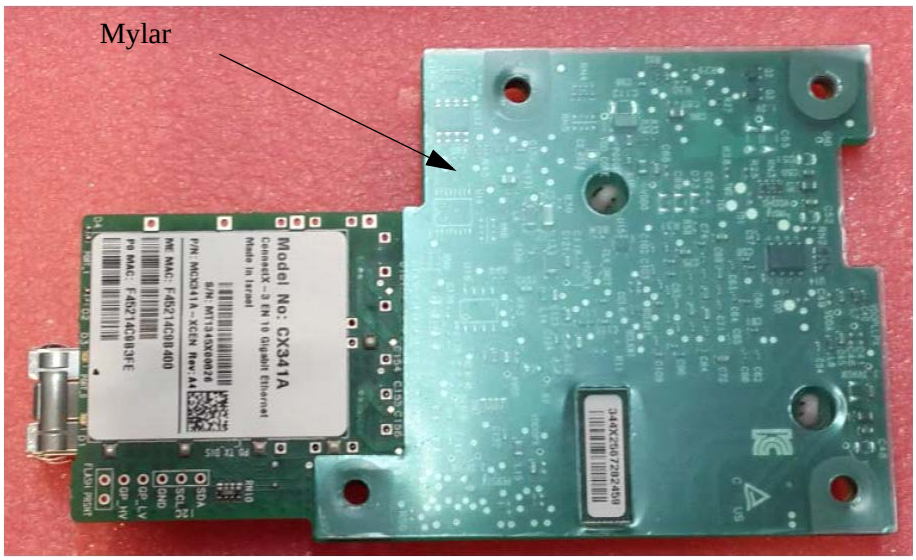


Figure 10: Mylar on Board



7.4 Adapter LED Operation

There are two I/O LEDs per port. See Table 10 for different LED functions.

Table 10 - Physical and Logical Link Indication

LED	Function
Green - physical link	• Constant on indicates a good physical link • If neither LED is lit, then the physical link has not been established
Yellow - logical (data activity link)	• A blinking yellow indicates activity (data transfer) • Stays off when there is no activity

The short bracket has the same port and LED footprints as the tall bracket.

7.5 Regulatory Statements

For regulatory statements for all ConnectX®-3 cards please refer to:
http://www.mellanox.com/related-docs/user_manuals/Regulatory_and_Compliance_Guide.pdf

Appendix A: Bezel Assembly (Optional)

It is recommended to support the cards SFP cages with a front bezel to protect against improper insertions and extractions of cables. The bezel design should be in compliance with section “Bezel Design for Systems Using SFP Transceivers” in the MSA INF-8074i Specification for SFP (Small Formfactor Pluggable) Transceiver.

The bezel should be designed with the following features:

- Cutouts should allow proper mounting of the cage assembly
- Dimensions of bezel cutouts and distance between them should be in compliance with MSA specification
- Insertion of bezel should compress the EMI ground springs of the cage assembly panel
- The bezel should not disturb the functioning of the locking latch when inserting cables into the cage

The bezel will cause the SFP cage to be slanted with respect to the board.

Figure 11: Bezel Assembly (Front View)

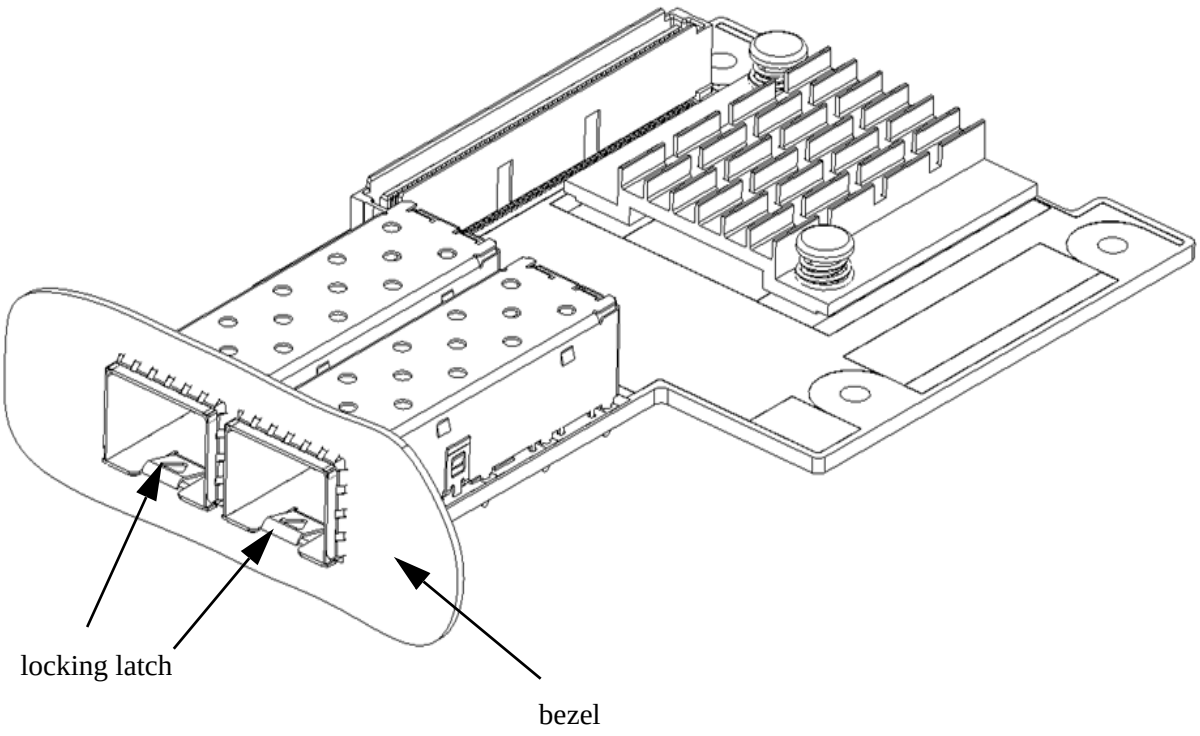
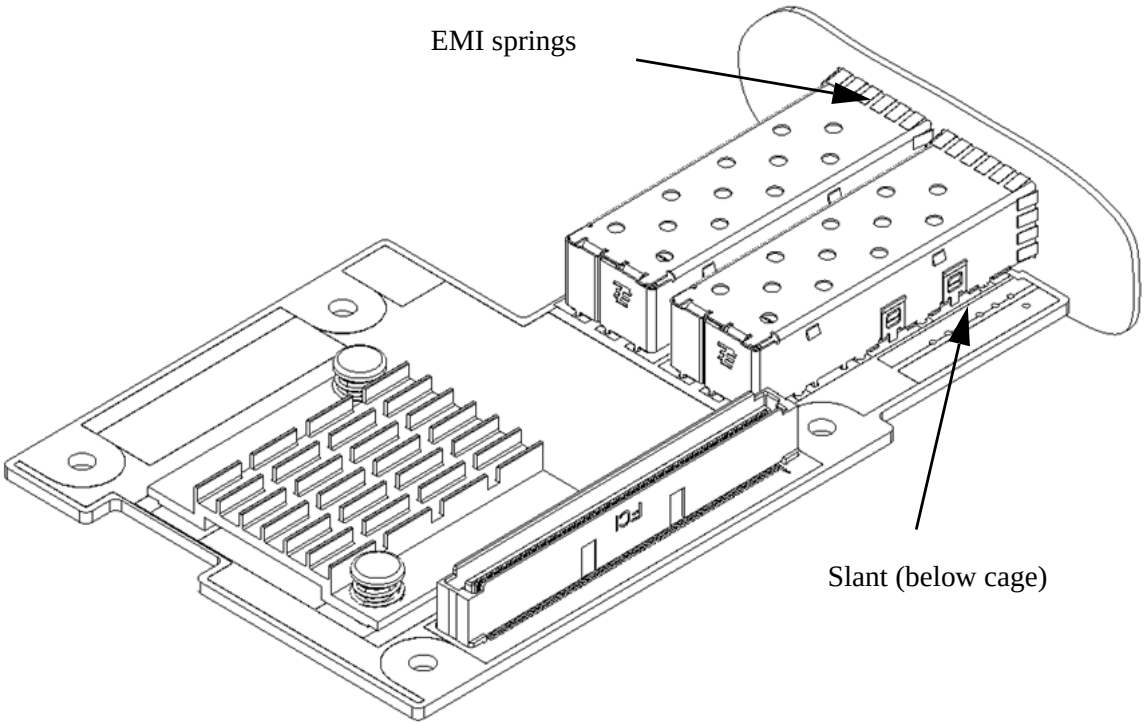


Figure 12: Bezel Assembly (Back View)



Appendix B: Card Change History

B.1 Changes in Rev A2 from Rev A1 (MCX341A-XCCN)

1. Added soldering instructions for 9 TH legs of SFP+ cage.
2. Board label change to the latest format.
3. Major revision change to A2.

B.2 Changes in Rev A3 from Rev A2 (MCX341A-XCCN)

1. FW change to 2.10.3898 (IPMI_DIS).
2. Major revision change to A3.

B.3 Changes in MCX341A-XCDN from MCX341A-XCCN

1. FW changes to 2.14.1250 (IPMI_EN)

B.4 Changes in MCX341A-XCEN from MCX341A-XCDN

1. FW changes to 2.14.1660
2. Added protective Mylar attached to the card - see Section 7.3.1, “Mylar Mechanical Drawing and Dimensions,” on page 47.

Appendix C: Finding the MAC/GUID and Serial Number on the Mezzanine Card

Each Mellanox Mezzanine card has a label on the print side that shows the card serial number and the card MAC for Ethernet protocol.

Note: The revision indicated on the labels in the following figures do not necessarily represent the latest revision of the card. Card revision changes are communicated via Product Change Notification (PCN) documents that are available via card suppliers.

Figure 13: MCX341A-XCCN Board Label (Example only - see Note)

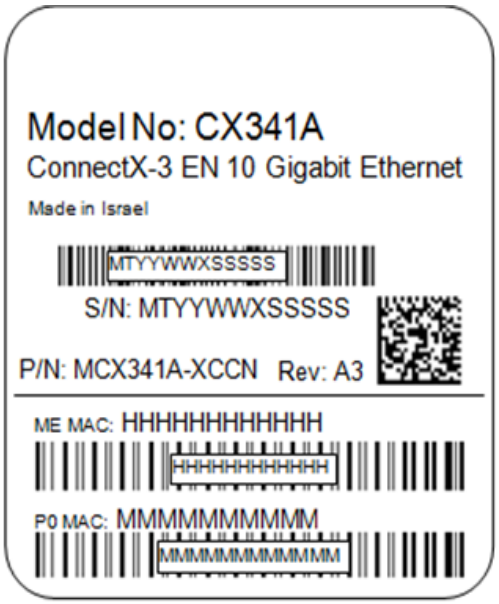


Figure 14: MCX341A-XCDN Board Label (Example only - see Note)

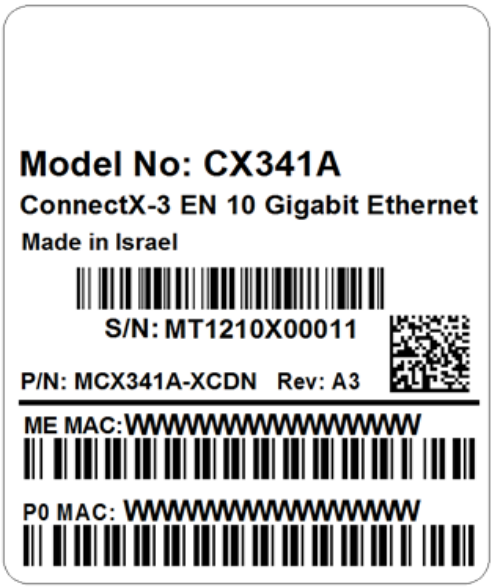


Figure 15: MCX342A-XCCN Board Label (Example only - see Note)

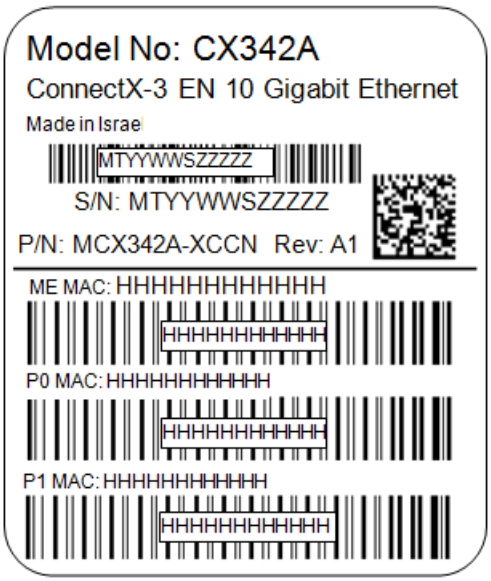


Figure 16: MCX342A-XCDN Board Label (Example only - see Note)

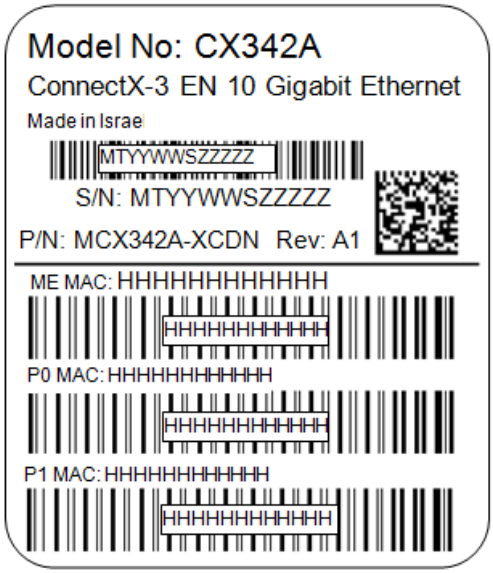
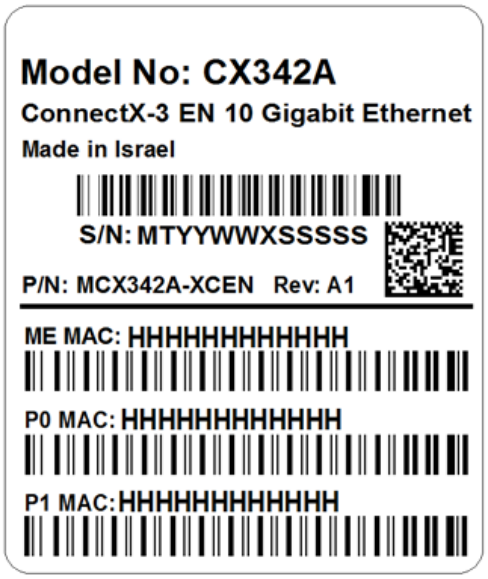


Figure 17: MCX341A-XCEN Board Label (Example only - see Note)

Figure 18: MCX342A-XCEN Board Label (Example only - see Note)



C.1 Retrieving Adapter Card GUID

On ConnectX-3 Ethernet adapter cards, there is a mismatch between the GUID value returned by firmware management tools and that returned by fabric/driver utilities that read the GUID via device firmware (e.g., using ibstat). Mlxburn/flint returns 0xffff as GUID while the utilities return a value derived from the MAC address. For all driver/firmware/software purposes, the latter value should be used. Please see the below example.

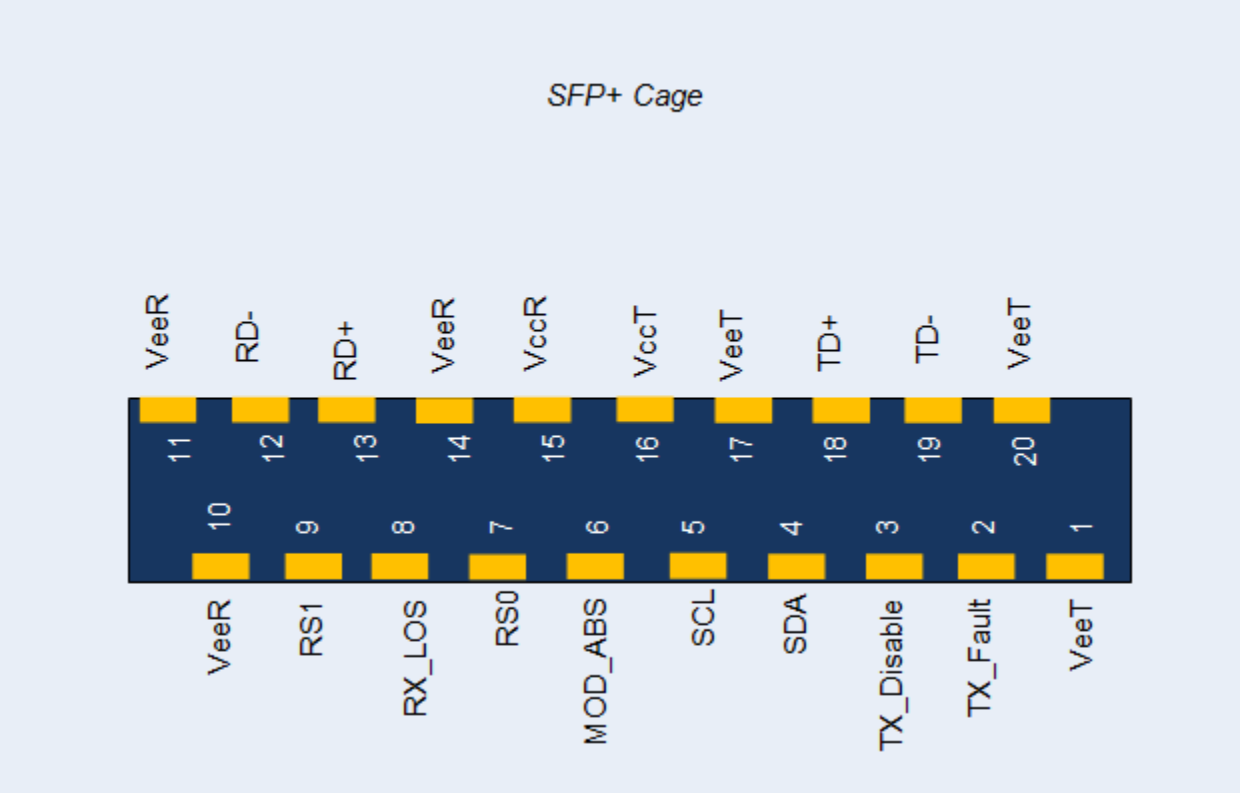
```
ibstat
CA 'mlx4_0'
        CA type: MT4099
        Number of ports: 2
        Firmware version: 2.30.4260
        Hardware version: 1
        Node GUID: 0x0002c90300305350
        System image GUID: 0x0002c90300305350
        Port 1:
                State: Down
                Physical state: Disabled
                Rate: 10
                Base lid: 0
                LMC: 0
                SM lid: 0
                Capability mask: 0x00010000
                Port GUID: 0x0202c9fffe305350
                Link layer: Ethernet
        Port 2:
                State: Down
                Physical state: Disabled
                Rate: 10
                Base lid: 0
                LMC: 0
                SM lid: 0
                Capability mask: 0x00010000
                Port GUID: 0x0202c9fffe305351
                Link layer: Ethernet
```

```
flint -d /dev/mst/mt4099_pci_cr0 q
Image type:      ConnectX
FW Version:      2.30.4260
Device ID:       4099
Description:     Node            Port1           Port2           Sys image
GUIDs:           ffffffffffffffff ffffffffffffffff ffffffffffffffff
ffffffffffffffff
MACs:                                  0002c9305350     0002c9305351
VSD:
PSID:            MT_1080120023
```

Appendix D: Interface Connectors Pinout

D.1 SFP+ Pinout

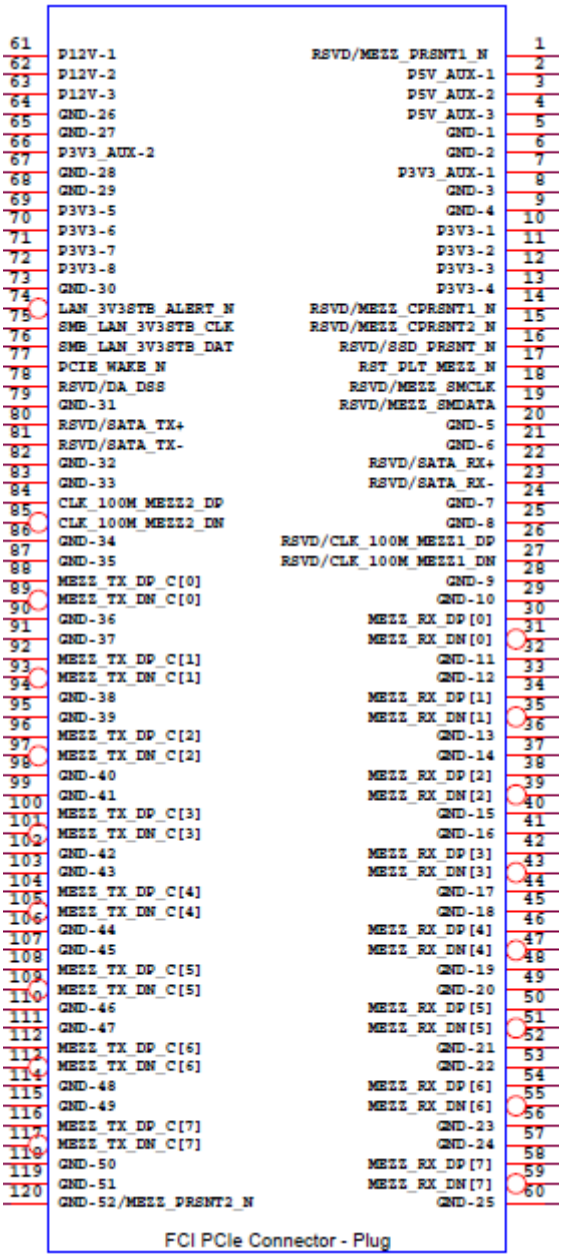
Figure 19: SFP+ Cage Pinout



D.2 PCI Express x8 Connector Pinout

The Mezzanine cards use a standard PCI Express x8 Mezzanine connector and the PCI Express x8 standard pinout according to the PCI Express 3.0 specification.

Figure 20: PCIe Connector Pinout



D.3 I²C-compatible Connector Pinout

Figure 21: Compatible Connector Plug and Pinout

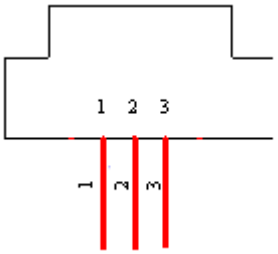
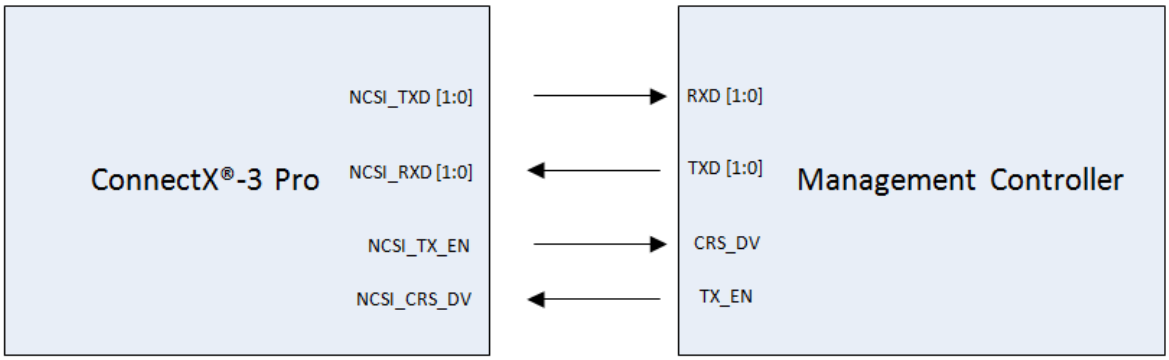


Table 11 - I2C-compatible Connector Pinout

Connector Pin Number	Signal Name
1	SPSDA
2	SPSCL
3	GND

D.4 NC-SI Interface Pinout

Figure 22: NC-SI Interface Pinout



Appendix E: Safety Warnings

For safety warnings in French see “Avertissements de sécurité d’installation (Warnings in French)” on page 34. For safety warnings in German see “Sicherheitshinweise (Warnings in German)” on page 36. For safety warnings in Spanish see “Advertencias de seguridad para la instalación (Warnings in Spanish)” on page 38.

1. **Installation Instructions**

Read all installation instructions before connecting the equipment to the power source.

2. **Over-temperature**

This equipment should not be operated in an area with an ambient temperature exceeding the maximum recommended: 55°C (131°F).
To guarantee proper air flow, allow at least 8cm (3 inches) of clearance around the ventilation openings.

3. **During Lightning - Electrical Hazard**

During periods of lightning activity, do not work on the equipment or connect or disconnect cables.

4. **Equipment Disposal**

Disposal of this equipment should be in accordance to all national laws and regulations.

5. **Local and National Electrical Codes**

This equipment should be installed in compliance with local and national electrical codes.

6. **Hazardous Radiation Exposure**

Caution – Use of controls or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CLASS 1 LASER PRODUCT and reference to the most recent laser standards: IEC 60 825-1:1993 + A1:1997 + A2:2001 and EN 60825-1:1994+A1:1996+ A2:2001

Appendix F: Avertissements de sécurité d'installation (Warnings in French)

1. **Instructions d'installation**

Lisez toutes les instructions d'installation avant de brancher le matériel à la source d'alimentation électrique.

2. **Température excessive**

Ce matériel ne doit pas fonctionner dans une zone avec une température ambiante dépassant le maximum recommandé de 55°C (131°F). Un flux d'air de 200LFM à cette température ambiante maximale est nécessaire. En outre, pour garantir un bon écoulement de l'air, laissez au moins 8 cm (3 pouces) d'espace libre autour des ouvertures de ventilation.

3. **Orages – dangers électriques**

Pendant un orage, il ne faut pas utiliser le matériel et il ne faut pas brancher ou débrancher les câbles.

4. **Installation du matériel**

Ce matériel ne doit être installé, remplacé ou entretenu que par du personnel formé et qualifié.

5. **Elimination du matériel**

L'élimination de ce matériel doit s'effectuer dans le respect de toutes les législations et réglementations nationales en vigueur.

6. **Codes électriques locaux et nationaux**

Ce matériel doit être installé dans le respect des codes électriques locaux et nationaux.

7. Exposition au rayonnement grave

Mise en garde – l'utilisation de commandes ou de réglages ou l'exécution de procédures autres que ce qui est spécifié dans les présentes peut engendrer une exposition au rayonnement grave.

PRODUIT LASER DE CLASSE 1 » et références aux normes laser les plus récentes CEI 60 825-1:1993 + A1:1997 + A2:2001 et NE 60825-1:1994+A1:1996+ A2:2001

Appendix G: Sicherheitshinweise (Warnings in German)

1. Installationsanleitungen

Lesen Sie alle Installationsanleitungen, bevor Sie das Gerät an die Stromversorgung anschließen.

2. Übertemperatur

Dieses Gerät sollte nicht in einem Bereich mit einer Umgebungstemperatur über der maximal empfohlenen Temperatur von 55°C (131°F) betrieben werden. Es ist ein Luftstrom von 200 LFM bei maximaler Umgebungstemperatur erforderlich. Außerdem sollten mindestens 8 cm (3 in.) Freiraum um die Belüftungsöffnungen sein, um einen einwandfreien Luftstrom zu gewährleisten.

3. Bei Gewitter - Elektrische Gefahr

Arbeiten Sie während eines Gewitters und Blitzschlag nicht am Gerät, schließen Sie keine Kabel an oder ab.

4. Geräteinstallation

Diese Gerät sollte nur von geschultem und qualifiziertem Personal installiert, ausgetauscht oder gewartet werden.

5. Geräteentsorgung

Die Entsorgung dieses Geräts sollte unter Beachtung aller nationalen Gesetze Bestimmungen erfolgen.

6. Regionale und nationale elektrische Bestimmungen

Dieses Gerät sollte unter Beachtung der regionalen und nationalen elektrischen Bestimmungen installiert werden.

7. Strahlenkontak

Achtung – Nutzung von Steuerungen oder Einstellungen oder Ausführung von Prozeduren, die hier nicht spezifiziert sind, kann zu gefährlichem Strahlenkontakt führen..

Klasse 1 Laserprodukt und Referenzen zu den aktuellsten Lasterstandards : ICE 60 825-1:1993 + A1:1997 + A2:2001 und EN 60825-1:1994+A1:1996+ A2:2001

Appendix H: Advertencias de seguridad para la instalación (Warnings in Spanish)

1. **Instrucciones de instalación**

Antes de conectar el equipo a la fuente de alimentación, leer todas las instrucciones de instalación.

2. **Sobrecalentamiento**

No se debe utilizar el equipo en un área con una temperatura ambiente superior a la máxima recomendada: 55°C(131°F). Además, para garantizar una circulación de aire adecuada, se debe dejar como mínimo un espacio de 8 cm (3 pulgadas) alrededor de las aberturas de ventilación.

3. **Cuando hay rayos: peligro de descarga eléctrica**

No utilizar el equipo ni conectar o desconectar cables durante períodos de actividad de rayos.

4. **Instalación de equipos**

La instalación, el reemplazo y el mantenimiento de este equipo estarán a cargo únicamente de personal capacitado y competente.

5. **Eliminación de equipos**

La eliminación definitiva de este equipo se debe efectuar conforme a todas las leyes y reglamentaciones nacionales.

6. **Códigos eléctricos locales y nacionales**

Este equipo se debe instalar conforme a los códigos eléctricos locales y nacionales.

7. Exposición a niveles de radiación peligrosos

Precaución: el uso de controles o ajustes o la realización de procedimientos distintos de los que aquí se especifican podrían causar exposición a niveles de radiación peligrosos.

PRODUCTO LÁSER DE CLASE 1 y referencia a las normas de láser más recientes: IEC 60825-1:2007/03 y EN 60825-1:2007